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Transportation Energy Contingency Plans for Rural Areas and Small Communities

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TRANSPORTATION ENERGY CONTINGENCY PLANS FOR RURAL AREAS AND SMALL COMMUNITIES

A Report to

The Ozarks Regional Commission

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Charles E. Dare
Transportation Institute
University of Missouri-Rolla
in cooperation with
The Meramec Regional Planning Commission

December, 1981

This technical assistance study was accomplished through a grant from the Ozarks Regional Commission. The statements, findings, conclusions, recommendations, and other data in this report are solely those of the Grantee and do not necessarily reflect the views of the Ozarks Regional Commission.

TRANSPORTATION ENERGY CONTINGENCY PLANS
FOR RURAL AREAS AND SMALL COMMUNITIES

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Finally, most sincere thanks are extended to the UMR students who worked on this investigation, especially those who were active in administering the questionnaires and analyzing the responses. Without their cooperation and dedication the work would not have been completed according to schedule.

TRANSPORTATION ENERGY CONTINGENCY PLANS
FOR RURAL AREAS AND SMALL COMMUNITIES

ABSTRACT

Following the petroleum supply disruption of the 1970's the Federal Government took actions to ensure continuation of transportation services during a critical situation. This led to the development of state transportation energy contingency plans; however the Missouri Transportation Fuels Emergency Plan, like those of many states, does not contain specific recommendations for small communities and rural areas.

In view of the status of transportation energy contingency planning with respect to small communities and rural areas, the following study was undertaken to determine the most effective transportation fuel conservation measures which could be implemented by such areas during energy emergencies. The study involved a review of the transportation fuels contingency planning literature, state transportation energy contingency plans (with special emphasis on that for Missouri) and transportation studies recently conducted in rural Missouri, together with a survey by mail of local government officials, telephone interviews with rural residents and participation in two community-wide attitude surveys in the Meramec Region of Missouri.

On the basis of the review of the literature and the results of the surveys, recommendations have been made on both the strategies that could be implemented to reduce gasoline consumption in rural areas and the institutional arrangements required for coping with a transportation fuels shortage. For small communities and rural areas of Missouri, it was specifically recommended that the multi-county regional planning commission should become the lead agency in implementing and coordinating fuel conservation measures in the event of a serious petroleum shortfall. Each regional planning commission would serve as a single focal point in communicating with the State Energy Office in behalf of its numerous county and city members. Furthermore, the existing statewide network of emergency preparedness officers should be utilized to inventory local fuel distribution services, monitor local service station operating practices and to serve motorists who might be stranded without fuel. Finally, the University of Missouri Cooperative Extension Service should offer educational programs covering topics as fuel conserving driving techniques, vehicle maintenance, trip planning, and ridesharing.

TRANSPORTATION ENERGY CONTINGENCY PLANS FOR RURAL AREAS AND SMALL COMMUNITIES

CHAPTER I. INTRODUCTION

The decades of the 1940's, 1950's and 1960's brought forth unprecedented growth in worldwide petroleum production and consumption. Through the 1960's the majority of new oil field discoveries were in the United States, Canada, and Venezuela; however, by the early 1970's several countries in the Persian Gulf along with nations as Nigeria were producing the major new sources for petroleum production. As we approached mid-1973 the price being paid for imported petroleum by the United States was on the order of $3.00 per barrel. By mid-1981 the price being paid has risen to $32.00 per barrel and higher for some sources on the international market.

Undoubtedly, one of the most critical energy-related events of the 1970's was the oil embargo against specific nations by Arab oil producing countries in 1973-74. This action caused the first significant petroleum shortage in the peacetime history of the United States. Following the removal of the emgargo the Organization of Petroleum Exporting Countries continued to escalate the price of petroleum so that it had reached $11.51 per barrel by January 1976. In the United States the price of gasoline at the pump was seen to double between 1960 and 1977; and then to double again by 1981. In late 1978 petroleum production in Iran was interrupted and the political environment in that country has remained in a rather unstable condition since that time. While estimates vary with respect to the impact of the embargo and the Iran situation, it is generally agreed that a 9% to 11% shortfall occurred during the embargo, while 3% to 5% shortfall followed the termination of imports from Iran. However, during short time intervals it is likely that shortfalls of 11% to 15% may have been experienced in certain parts of the United States since the shortfalls were not uniformly distributed.

The petroleum supply interruptions had serious consequences in the United States. The speed limit was reduced to 50 mph on our highways, then raised to 55 mph a short time later. Service station closings were not unusual; weekend travelers had much concern about finding adequate fuel supplies for long distance trips. Service stations instituted self-serve lines to cut the amount they would have to charge per gallon. In many parts of the country waiting lines developed at service stations, and in some locations drivers were willing to sleep overnight in their vehicle to retain a place in line for the next morning's sales.

Unfortunately, our petroleum supply disruptions happened at a time when the United States was moving toward being more and more dependent on imports. As shown in Table 1, in 1960 the U.S. imported only 18.5% of the domestic consumption. By 1970, imports accounted for 23.3% of consumption. Even following the 1973-74 embargo, the percentage of petroleum which was imported continued to rise. The maximum percentage appears to have been reached in 1977 when 47.7% of our petroleum was imported. (1)

TABLE 1. TRENDS IN DOMESTIC PETROLEUM CONSUMPTION, DOMESTIC CRUDE OIL PRODUCTION AND PETROLEUM IMPORTS (Thousands of barrels per day)

Year	Domestic Petroleum Consumptions	Domestic Production: Crude Oil	Imports: Refined and Crude Oil	Imports as a Percentage of Domestic Consumption
1960	9,825	7,989	1,820	18.5
1970	14,696	11,321	3,419	23.2
1973	17,308	9,208	6,256	36.2
1974	16,653	8,774	6,112	36.7
1975	16,322	8,375	6,056	37.1
1976	17,461	8,132	7,313	41.9
1977	18,431	8,245	8,787	47.7
1978	18,847	8,707	8,203	43.5
1979	18,376	8,514	8,212	44.7

Source: "Transportation Energy Conservation Data Book, Edition 4," Oak Ridge National Laboratory, September, 1980, pg. 5-15.

The problems associated with shortfalls in petroleum supply have been and will continue to be an especially serious concern for the transportation sector in the United States and in other nations. As shown in Table 2, the transportation sector does consume about 53% of the petroleum used in the U.S., with automobiles and trucks accounting for 43% of the total. A review of the trends in fuel consumed for highway vehicle travel reveals startling increases have occurred since 1960. The data in Table 3 indicate the fuel consumed for highway travel doubled in the period from 1960 to 1980, having reached a peak of 125,067,000,000 gallons per year in 1978. (2)

At a conference held in 1980, experts convened by the Transportation Research Board expressed their concerns relating to the cost of petroleum and the uncertainty of petroleum supplies by publishing the following conclusions: (3)

1. "Real prices will probably continue to rise substantially, even without future supply interruptions."

2. "The probability of supply interruptions in the 1980's is even greater than indicated by conditions a decade ago."

TABLE 2. PETROLEUM CONSUMPTION BY END-USE SECTOR

Consuming Sector	Percent of U.S. Petroleum Consumption, 1978*
Industrial	20.2
Residential & Commercial	16.9
Electric Utilities	10.3
Automobiles	29.0
Aircraft	4.4
Trucks	14.1
Other Transportation	5.1
Total	100.0

Source: "Transportation Energy Conservation Data Book, Ed. 4," Oak Ridge National Laboratory, September, 1980, pg. 1-8.

TABLE 3. FUEL CONSUMED FOR HIGHWAY VEHICLE TRAVEL IN THE U.S. (Millions of gallons per year)

Year	Autos and Motorcycles	Buses	Trucks	All Motor Vehicles
1960	41,169	827	15,832	57,878
1970	65,784	944	25,600	92,328
1975	76,457	895	31,632	108,984
1978	83,775	1,021	40,271	125,067
1979	80,233	1,023	40,859	122,115
1980	(Preliminary Estimate)			116,944

Source: "Highway Statistics," FHWA, USDOT, various years.

3. "The severity of future supply interruptions is likely to exceed those of 1973 and 1979."

4. "No major new oil discoveries or production capacities that would substantially change the above outlook are likely to materialize during the 1980's."

The problem of transportation fuel availability during a shortfall or emergency situation has been recognized to be of such great importance that Federal legislation has been enacted to ensure continuation of essential transportation activities during a critical situation. Specifically, on November 5, 1979, Congress passed the Emergency Energy Conservation Act (Public Law 96-102) to provide a mechanism through which Federal and State governments would develop plans handling emergency energy distributions. (4) The Act specifies that if the President finds an energy supply disruption to exist or to be imminent, he may establish monthly conservation targets for each affected energy source for the nation and for each state. Following the publication of target values, each state must submit their plan (to the U.S. Department of Energy) which satisfies or exceeds the target values. Furthermore, the states were encouraged to prepare their plans as soon as possible for tentative approval.

In Missouri, the draft Missouri Energy Emergency Plan (5) was published on March 1, 1980, which was followed by the draft Missouri Transportation Fuels Emergency Plan (6) in June, 1980. These plans contain strategies similar to those recommended by the U.S. Department of Energy in the February 7, 1980 Federal Register (45 FR 8462). (7) Twelve categories of Individual Emergency Relief Measures were developed, as follows:

(1) Reduced Transportation Fuels Consumption by State Government

(2) "More Missouri Per Gallon" Public Information Campaign

(3) Ridesharing Program

(4) Driver Energy Conservation Awareness Training Program

(5) Reduced Transportation Fuels Consumption by Local Governments

(6) Minimum Purchase and Flag Program

(7) Odd/Even Purchase and Flag Program

(8) Daily Sales Limits and Staggered Operating Periods

(9) Liberalization of State Regulations on Truck Weights

(10) Vehicle Speed Limitations

(11) Truck and Automobile Fleet Energy Management Program

(12) Mandatory Sticker Plan

Furthermore, in the event of an especially serious situation, additional reduction could necessitate implementation of a standby gasoline rationing plan. The rationing plan would be one of several measures available if a

shortfall of 20 percent of gasoline, diesel fuel and heating oil was anticipated.

In its present stage of development, the Missouri Energy Emergency Plan appears to contain transportation fuel conservation measures which are primarily oriented toward the larger communities and metropolitan regions. Furthermore, a brief review of the state-of-the-art of transportation energy contingency planning reveals no thorough effort to identify plans which would be viable, acceptable and reasonable in small communities and rural areas. It appears that this subject has not been explored by anyone or any agency up to now although rural agriculture, mining, livestock raising and other forms of employment would be of critical importance during any sort of a national emergency. This subject has been addressed, somewhat indirectly, by an American Society of Civil Engineers position paper on Rural Public Transportation. (8) This paper states "More than 84 million Americans live in rural and small urban areas. The trip-making of these non-urbanized residents is characterized by a dispersed origin-destination pattern that results from the low density land use of rural areas. Rural residents must travel farther than their urban counterparts to meet the basic needs of employment, food, medical care, and essential social services."

"This problem has been compounded by the trend toward centralized service and retail centers at the expense of local community services. Other factors include the changing economic base of rural areas and the influx of former urban residents. Three-fourths of rural families are now nonfarm families. More people must now travel both to work and to secure the goods and services that were originally available on the more self-sufficient farms."

Supporting these concerns relative to rural areas and small city transportation are the data shown in Tables 4 and 5. As shown in Table 4, the nationwide work force is distributed such that over 30% of our workers reside in areas outside Standard Metropolitan Statistical Areas (SMSA's). (9) Furthermore, the vehicle miles traveled in 1977, as presented in Table 5, indicate that almost 35% of travel takes place outside SMSA's on a nationwide basis. (10)

Returning to the Missouri Energy Emergency Plan, another aspect of transportation energy contingency planning to be considered is the desirability for local government and regional planning commission involvement in any fuel emergency and conservation program. Regional planning commissions could function as an intermediate coordinator between small cities/rural areas and state level agencies. Cooperation among all levels of government would be imperative to facilitate minimizing fuel use; however, the communication channels, authorities and responsibilities of the various government agencies have not yet been clarified.

In view of the status of transportation energy contingency planning with respect to small communities and rural areas, the University of Missouri-Rolla and the Meramec Regional Planning Commission requested support from the Ozarks

TABLE 4. NATIONWIDE WORK FORCE ACCORDING TO PLACE OF RESIDENCE

Location of Residence	Number of Workers*	Percent of Workers
Inside SMSA	54,103,162	68.3%
Outside SMSA:		
Over 5,000 population	12,357,384	15.6%
Under 5,000 population	12,753,454	16.1%
Total	79,214,000	100.0%

*Excludes workers not reporting distance in the survey.

Source: Home-to-Work Trips and Travel, Report No. 4, Nationwide Personal Transportation Study, 1977. FHWA, USDOT, Office of Highway Planning, December, 1980, pg. 9.

Regional Commission to evaluate certain aspects of contingency plan development. The study was approved and it was stipulated that the three following objectives would be met:

Objective 1: Determine the most effective transportation fuel conservation measures which should be implemented by small communities and rural areas during energy emergencies. To meet this objective it will be necessary to review the programs in the Missouri Energy Emergency Plan such as: Ridesharing Programs, Reduced Transportation Fuels Consumption by Local Governments, Minimum Purchase and Flag Program, Odd/Even Purchase and Flag Program, Daily Sales Limits and Staggered Operating Periods, Vehicle Speed Limitations, and the Mandatory Sticker Plan.

Objective 2: Identify the role of rural oriented Regional Planning Commissions (RPC) in coordinating fuel conservation efforts among state-level agencies, and county and city authorities. The duties of the regional agencies, the communication links, as well as the responsibilities and authority of the RPC should be clarified.

Objective 3: Prepare a handbook, or emergency action guide, for use by local agencies in the event of a transportation fuel shortage. This handbook should identify communication links, actions to be taken and anticipated benefits to be expected at the local level.

TABLE 5. DRIVERS AND ANNUAL MILES DRIVEN IN 1977 ACCORDING TO PLACE OF RESIDENCE IN U.S.

Location of Residence	Number of Drivers	Percentage Distribution of Drivers	Number of Miles Driven	Percentage Distribution of Miles Driven
Inside SMSA	76,520,000	66.1%	760,475,532,000	65.6%
Outside SMSA				
Over 5,000 population	18,672,000	16.1%	181,846,189,000	15.7%
Under 5,000 population	20,640,000	17.8%	216,710,308,000	18.7%
Total	115,833,000	100.0%	1,159,032,029,000	100.0%

Source: Characteristics of 1977 Licensed Drivers and Their Travel, Report No. 1, Nationwide Personal Transportation Study, 1977. FHWA, USDOT, Office of Highway Planning, October, 1980, pg. 27.

CHAPTER 2. CHARACTERISTICS OF MISSOURI AND THE MERAMEC REGION

Prior to considering the suitability of potential transportation fuel conservation measures for rural areas and small cities, a profile of pertinent transportation and socio-economic factors will be presented for the six-county Meramec Region. Also several characteristics of the State of Missouri will be presented to assist in describing the importance of petroleum and transportation in the state and in rural areas.

The State of Missouri:

The State of Missouri covers 68,995 square miles; has a 1980 population of 4,917,444 and is regarded as an important agricultural, forestry and mining state. The population of Missouri is concentrated in two major metropolitan areas, in and around St. Louis and Kansas City. These two areas, when combined with the other SMSA's account for 3,026,006 of the state population. Eleven counties, as well as St. Louis City, constitute the SMSA's in Missouri according to the 1970 Bureau of the Census boundaries. There are 114 counties in the state, leaving 103 in non-SMSA areas. The distribution of these non-SMSA counties according to number and size is shown in Table 6. (11) This tabulation reveals there are over 1,000,000 residents of Missouri in counties having a population of 30,000 or less; and that almost 2,000,000 residents live in non-SMSA counties.

TABLE 6. MISSOURI NON-SMSA COUNTIES GROUPED BY 1980 POPULATION

Population Group Range	Number of Counties	Population in this Group
5,000 or less	3	12,672
5,000 to 10,000	23	176,873
10,000 to 20,000	44	625,641
20,000 to 30,000	20	493,642
30,000 and greater	13	582,610
Total	103	1,891,438

Source: U.S. Bureau of the Census, Advance Reports, 1980 Census of Housing and Population, PHC 80-V-27, Missouri, March, 1981.

A similar tabulation of population for cities in non-SMSA counties is shown in Table 7. (11) All cities located in SMSA counties are excluded from this analysis. It is significant that almost 500,000 residents of Missouri are located in incorporated places of 5,000 or less population, excluding towns of that population range in SMSA counties. Also, there are relatively

TABLE 7. RURAL COMMUNITIES IN MISSOURI, 1980 POPULATION GROUPS

Population Range	Number of Incorporated Places in this Range	Population in this Group
500 or less	401	75,995
500 - 1,500	166	141,600
1,500 - 2,500	51	101,192
2,500 - 5,000	47	162,633
5,000 - 10,000	23	164,438
10,000 - 15,000	7	84,073
15,000 - 20,000	4	70,545
20,000 - 30,000	1	20,927
30,000 - 50,000	3	106,873
Total	703	928,276

few communities in the population ranges of 10,000 up to 50,000; with 688 communities of a size less than 10,000 residents.

The agricultural industries of Missouri are more extensive than most people realize. Despite adverse weather conditions of 1980, the total value of Missouri's principal crops amounted to 2.43 billion dollars (12) in that year. There are approximately 120,000 farms in Missouri and they cover an estimated 31,500,000 acres. The national ranking of selected Missouri agricultural items is shown in Table 8.

Missouri's timber is a resource of primary importance to the state and its economy. The most recent Forest Survey of Missouri was performed in 1972. (13) At that time forest land in Missouri covered 12,900,000 acres, with a volume of growing stock equal to 6.0 billion cubic feet. There were 681 active wood using plants in the state in 1969. The 549 active sawmills produced 368,000,000 board feet of lumber in 1969. Missouri charcoal kilns produced 125,000 tons in 1969 and loggers harvested 54,000,000 board feet of cooperage logs and bolts in that year, making Missouri the national leader in the production of these items. A map showing the location of major forest industry activities is shown in Figure 1. The Mark Twain National Forest covers over 1,450,000 acres in the state and it offers extensive recreation areas, wildlife habitats, and mineral resources as well as land for timber production. In 1980, Missouri counties realized over $4,501,000 in payments received from the Mark Twain National Forest.

TABLE 8. SELECTED MISSOURI AGRICULTURAL CHARACTERISTICS

Agricultural Item	Percent of U.S. Total	National Rank
Tall fescue seed	69	First
Corn for forage (acres harvested)	13	Second
Beef cows, number	6	Second
Calves born	5	Second
Breeding hogs	7	Fourth
Turkeys raised	8	Fifth
Soybean production	8	Fifth
Farm Workers, number	4	Eighth

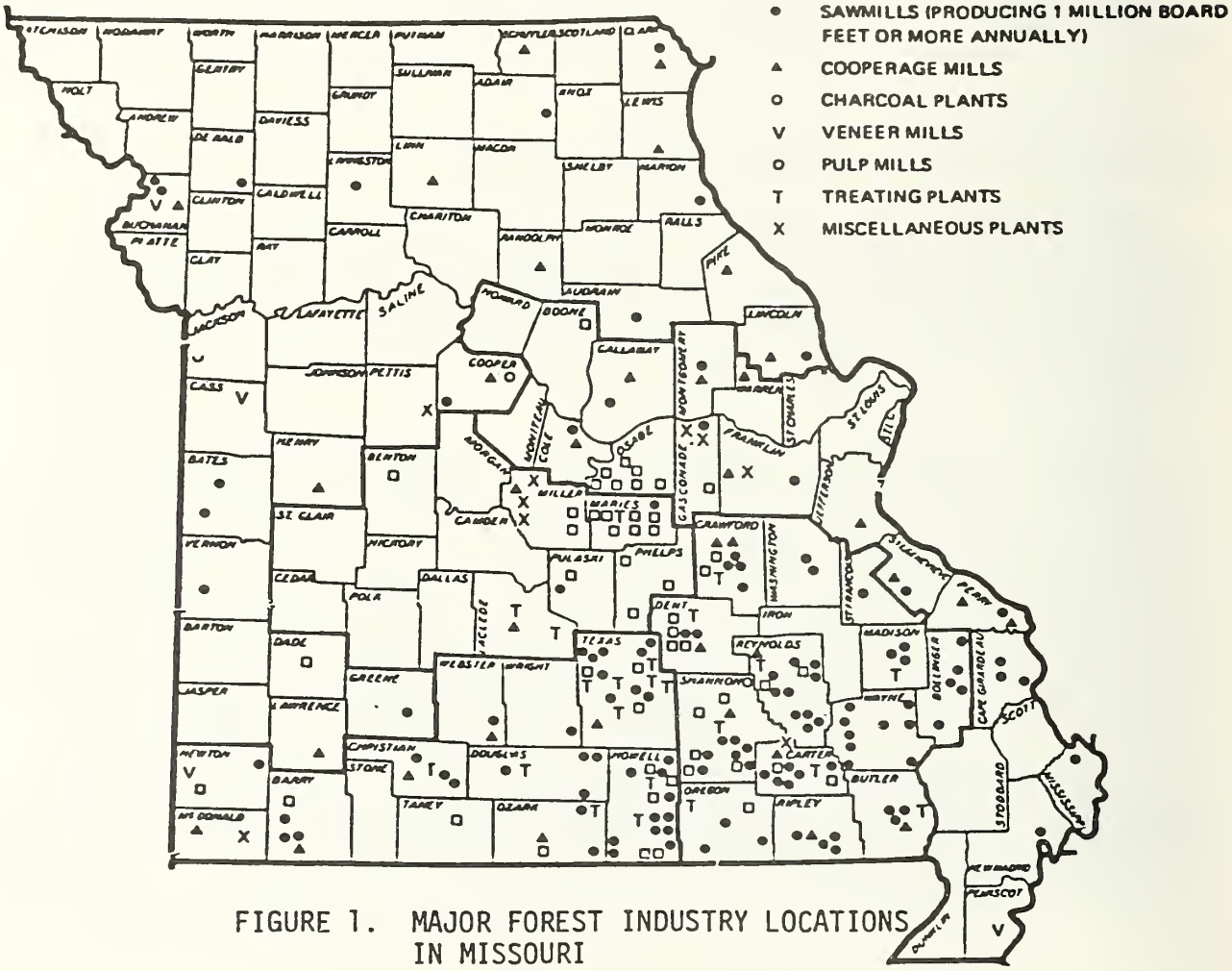


FIGURE 1. MAJOR FOREST INDUSTRY LOCATIONS IN MISSOURI

The mineral resources of Missouri are also quite extensive, with some reports (14, 15, 16) indicating potential for locating several of the strategic minerals which must now be almost entirely imported by the U.S. A new record was established for nonfuel minerals produced in Missouri when mineral output in 1979 increased by 34% over the previous year, rising to over $1,100,000,000. A tabulation of the minerals contributing to this extensive state industry is shown in Table 9. The coal reserves of Missouri were estimated to be 47,443,700,000 tons as of July, 1976, with recoverable reserves estimated at 4,987,700,000 tons. (17) In 1977, 13 companies were operating 17 mines in 8 counties of Missouri. However, in 1980, coal production was only 5,500,000 tons, which represented a decrease to about the same level as in 1975. Approximately 90% of the coal produced in Missouri is used in electric power generating plants.

TABLE 9. VALUE OF NONFUEL MINERAL PRODUCTION IN MISSOURI

Mineral	Value of 1979 Production, dollars	Rank Nation, 1977
Barite	3,679,000	2
Cement	198,444,000	5
Clays	20,522,000	1
Copper	26,705,000	
Gem stones, Gold	20,000	
Lead	547,824,000	1
Lime	70,187,000	3
Sand and Gravel	31,310,000	
Silver	24,410,000	6
Stone	140,029,000	7
Zinc	50,723,000	2
Other	45,982,000	
Total	1,159,835,000	

Source: The Mineral Industry of Missouri, Bureau of Mines Mineral Yearbook, 1978-79.

Interest in Missouri oil and natural gas resources has increased substantially in the past two years. However, oil and natural gas production is still very limited, with only 130,350 barrels of oil being produced in 1980. (18)

A map showing the major mineral producing regions in Missouri in 1978 is shown in Figure 2. Major transportation routes are also shown on this map, and it is evident many of our state resources are in locations such that movement by highway would be a necessity.

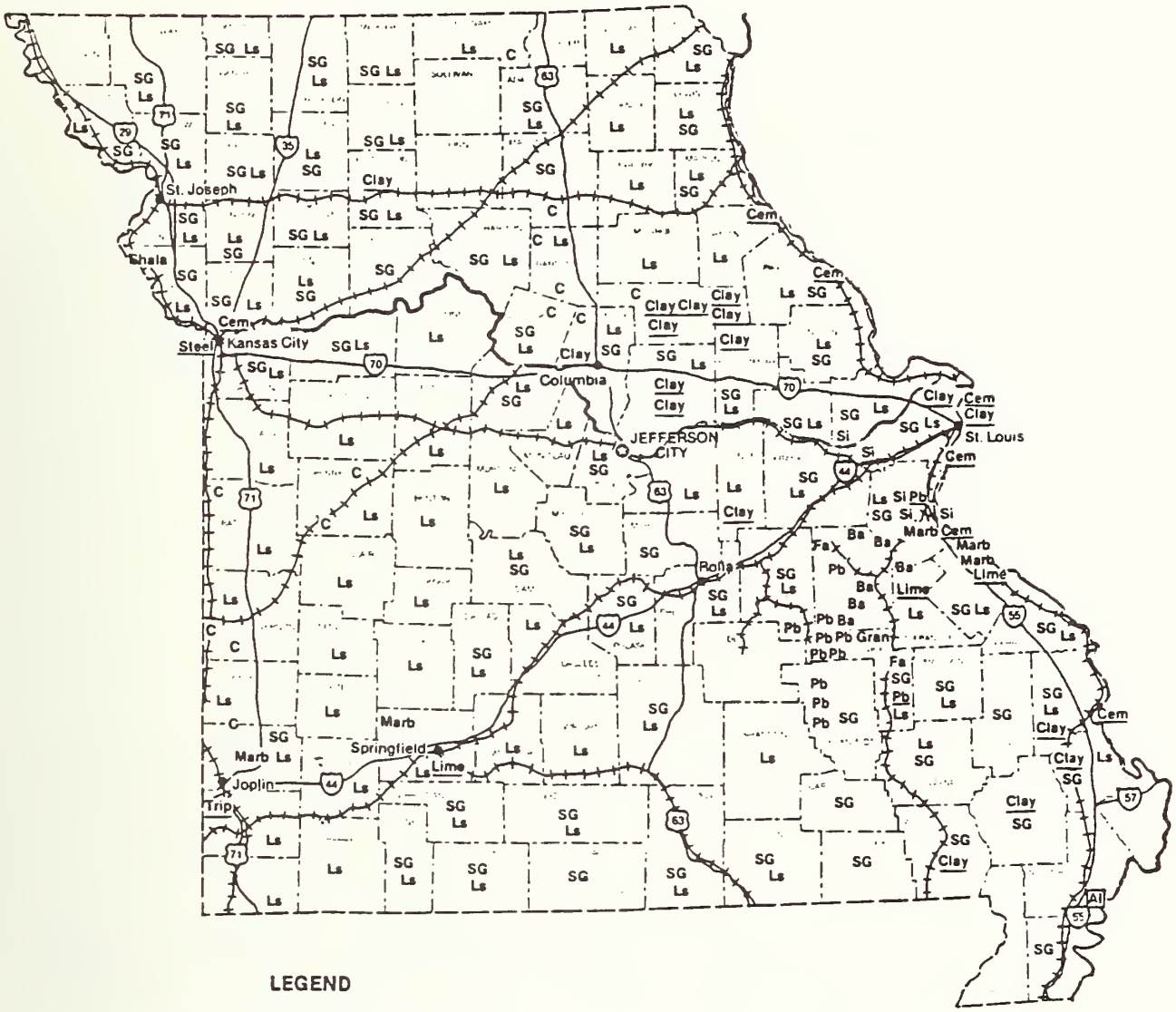
Of significant importance to fuel consumption in Missouri is the means of transportation to work. Table 10 shows a model analysis of travel to work for rural areas and several city population groups. (19) It is clear that the private automobile is the most important mode for all categories shown. A higher percentage of people "Walk only" in the population group 10,000-50,000 than in any other category. In rural areas 13.6% of the workers were found to work at home. Buses accounted for 0.5% or less of the work trips in cities under 50,000; and for only 8.1% of the work trips in larger cities.

The Meramec Region:

The focus of this study is the six-county area served by the Meramec Regional Planning Commission (MRPC) in southeast-central Missouri. Figure 3 shows the location of the MRPC counties in relationship to the 19 other Regional Planning Commissions in Missouri. The six-county Meramec Region covers 2,997 square miles. The size of each county as well as recent population trends are shown in Table 11. All of the Meramec Region counties are exhibiting a growth trend, although Maries County experienced a decrease in the years from 1950 to 1970. Data for the region indicate a 17.4% increase in population from 1970 to 1980. Although a farm; non-farm; non-town; town breakdown is not yet available for 1980, it is apparent that at least through 1970 the region has been experiencing an astounding growth in the "non-town, non-farm" category. In fact, from 1950 to 1970, the "non-town, non-farm" population increased by almost 170 percent. There are 24 incorporated places in the Meramec Region, with 3 of these located partially outside the region boundaries. Table 12 shows the population of these incorporated places, as well as the 1970 and 1980 population, county population and population density.

The population of the communities in the Meramec Region appears to be holding reasonably steady. The largest city in the region is Rolla, which experienced a slight decline in population from 1970 to 1980. It is interesting, however, that the townships adjacent to Rolla experienced a 37% increase in population during this period, while Phelps County experienced a 14% increase. Population density, as measured at the county level, indicates a rather low density. Five counties have a density of 14-25 persons per square mile, while Phelps County is close to 50 persons per square mile. This higher density and higher population for Phelps County is primarily attributable to the University of Missouri-Rolla which had an enrollment of about 5,500 students at the time of the 1980 census.

Table 13 summarizes the employment characteristics of the Meramec Region from 1950-1970. Those engaged in services, manufacturing, retail trade, construction and agriculture dominate.



LEGEND

Mineral Symbols

- Al — Aluminum plant
- Ba — Barite
- C — Coal
- Cem — Cement plant
- Clay — Clay products
- Fe — Iron ore
- Gran — Granite
- Lima — Lime plant
- Ls — Limestone
- Marb — Marble
- Pb — Lead ore
- Pb — Lead smelter
- SG — Sand and Gravel
- Shale — Shale
- Si — Silica sand
- Steel — Steel plant
- Trip — Tripoli

- City
- Inland waterway
- Railroad
- Road
- Interstate highway
- U.S. highway

FIGURE 2

MAJOR MINERAL PRODUCING REGIONS IN MISSOURI

TABLE 10. MEANS OF COMMUTING TO WORK BY SIZE OF PLACE IN MISSOURI

Means of Transportation	Location of Residence				
	Rural	2,500-10,000	10,000-50,000	50,000*	Total
Auto Driver	65.8%	69.5%	60.5%	69.2%	67.7%
Auto Passenger	10.9%	13.5%	14.0%	14.0%	13.1%
Bus or Streetcar	0.5%	0.5%	0.3%	8.1%	4.9%
Subway or Rail	-	-	-	-	-
Taxicab	0.1%	0.7%	1.6%	0.5%	0.5%
Walked Only	4.9%	9.1%	18.5%	4.9%	6.3%
Other Means	4.1%	4.2%	2.6%	1.4%	2.4%
Worked at Home	13.6%	2.5%	2.5%	1.8%	5.1%
Percent Total	100.0%	100.0%	100.0%	100.0%	100.0%
Number of Workers	474,296	143,557	131,806	1,019,454	1,769,113

Source: U.S. Bureau of the Census, Census of Population: 1970, Vol.1, Characteristics of the Population, Part 27, Missouri.

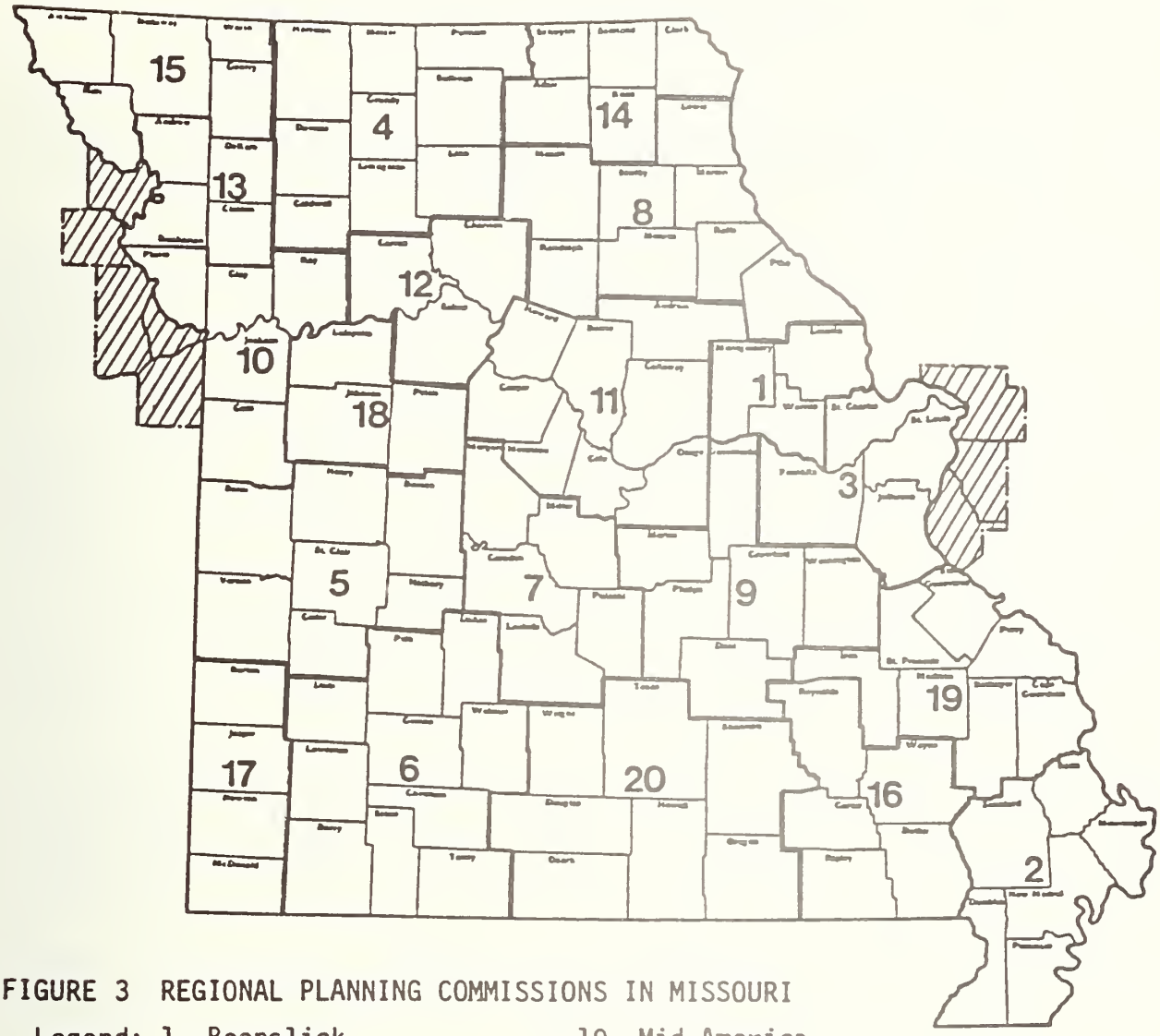


FIGURE 3 REGIONAL PLANNING COMMISSIONS IN MISSOURI

Legend:
1. Boonslick
2. Bootheel
3. East-West Gateway Coordinating Council
4. Green Hills
5. Kaysinger Basin
6. Southwest Missouri
7. Lake of the Ozarks
8. Mark Twain
9. Meramec (Crawford, Dent, Gasconade, Maries, Phelps & Washington Counties)
10. Mid-America Regional Council
11. Mid-Missouri
12. Missouri Valley
13. MO-Kan Bi-State
14. Northeast Missouri
15. Northwest Missouri
16. Ozark Foothills
17. Ozark Gateway
18. Show-Me
19. Southeast Missouri
20. South Central Ozarks

TABLE 11. COUNTY AND MERAMEC REGION POPULATION TRENDS

County	Year	Population			
		Farm	Non-Town Non-Farm	Town	Total
Crawford	1950	5,703	2,235	3,677	11,615
	1960	2,814	5,340	4,493	12,647
	1970	1,914	7,138	5,776	14,828
	1980				18,300
Dent	1950	5,827	1,498	3,611	10,936
	1960	2,838	3,737	3,870	10,445
	1970	1,794	5,091	4,572	11,457
	1980				14,517
Gasconade	1950	4,923	1,361	6,058	12,342
	1960	3,368	2,405	6,422	12,195
	1970	2,454	2,955	6,469	11,878
	1980				13,181
Maries	1950	5,299	747	1,377	7,423
	1960	3,063	2,667	1,552	7,282
	1970	2,288	3,016	1,547	6,851
	1980				7,551
Phelps	1950	6,062	2,992	12,450	21,504
	1960	2,975	7,146	15,275	25,396
	1970	1,975	9,879	17,627	29,481
	1980				33,633
Washington	1950	5,621	5,819	3,249	14,689
	1960	2,297	8,458	3,591	14,346
	1970	1,531	9,993	3,562	15,086
	1980				17,983
Region Total	1950	33,435	14,652	30,442	78,509
	1960	17,355	29,753	35,203	82,311
	1970	11,956	39,553	38,072	89,581
	1980				105,165

Source: U.S. Bureau of the Census, Various years.

TABLE 12. MERAMEC REGION CITY POPULATION

County / City	Population 1970	Population 1980	Population Density (persons/square mile) 1970	Population Density (persons/square mile) 1980
Crawford:	14,828	18,300	19.5	24.1
Bourbon	955	1,259		
Cuba	2,070	2,120		
Leasburg	218	304		
Steelville	1,392	1,470		
Sullivan*	5,111	5,461		
Dent:	11,457	14,517	15.2	19.2
Bunker*	447	673		
Salem	4,363	4,454		
Gasconade:	11,878	13,181	22.9	25.4
Bland	621	662		
Gasconade	235	250		
Hermann	2,658	2,695		
Morrison	234	169		
Owensville	2,416	2,241		
Rosebud	305	326		
Maries:	6,851	7,551	13.0	14.4
Belle*	1,133	1,233		
Vienna	505	514		
Phelps:	29,567	33,633	43.5	49.7
Doolittle	535	701		
Newburg	806	743		
Northwye	138	135		
Rolla	13,571	13,303		
St. James	2,929	3,328		
Washington:	15,086	17,983	19.9	23.7
Caledonia	113	162		
Irondale	319	349		
Mineral Point	369	358		
Potosi	2,761	2,528		
Region	89,667	105,165	22.4	26.3

Source: U. S. Bureau of the Census, 1970 and 1980.
*Note: City partially located outside the region.

TABLE 13. LABOR FORCE DISTRIBUTION BY MAJOR OCCUPATION FOR MERAMEC REGION

Occupation Group	Census Year		
	1950	1960	1970
Agriculture, Forestry Fisheries	8,869	4,131	2,007
Mineral Extraction	719	654	1,751
Construction	1,458	1,864	2,347
Manufacturing	5,674	7,304	6,996
Wholesale Trade	365	557	650
Retail Trade	3,020	3,953	4,805
Services	3,271	4,243	7,343
Communications	138	271	395
Transportation and Utilities	1,224	1,307	1,158
Finance, Insurance and Real Estate	259	408	789
Public Administration	1,008	1,662	1,667
Total	26,005	26,354	29,908

Source: U.S. Bureau of the Census, various years.

One other indicator showing the importance of highway vehicle transportation is the trend in motor vehicle registrations for the Meramec Region as shown in Table 14. Comparing vehicle registrations from 1950 to 1979, the region experienced an increase of 183%, with Phelps County leading with a 220% increase; however, each county does have a strong continuing growth in motor vehicle registrations.

The major highway network for the Meramec Region is shown on the map in Figure 4. Interstate Highway 44 passes diagonally through the region, following the Chicago-Los Angeles route of old Highway 66. Also, a major north-south highway, U.S. 63, passes through the region, meeting I-44 at Rolla. Highway 72 connects Rolla, Salem and Bunker, Highway 19 extends from Salem to Hermann through Steelville and Cuba. U.S. Highway 50 passes through Gasconade County on its route between Jefferson City and St. Louis, and Highway 8 connects St. James, Steelville and Potosi. Selected travel distances within the region and to population centers outside the region are shown in Table 15. An interesting comparison of traffic volume changes on Meramec Region rural highways is shown in Table 16. Using Average Daily Traffic (ADT) from Missouri Highway and Transportation Department traffic maps for 1965 and 1980, some noticeable increases may be observed. For instance, volumes on I-44 are on the order of 11,000-13,000 ADT and have increased by about 30-35% since 1965. Volumes on Highway 63 vary considerably, but have increased anywhere from 66% to 164% in the same period. Several highways carrying modest traffic volumes have shown increases of 70% or more. Actually the Interstate Highway 44 volumes have exhibited one of the lower percentage increases in the region, while several rural two-lane highways have doubled their ADT in 15 years.

TABLE 14. TRENDS IN MOTOR VEHICLE REGISTRATION FOR COUNTIES IN THE MERAMEC REGION: 1950-1979

Year	State of* Missouri	MRPC Counties**						MRPC Total
		Crawford	Dent	Gasconade	Maries	Phelps	Washington	
1950	1,269,592	3,898	3,589	4,205	2,043	6,752	3,732	24,219
1960	1,730,035	5,783	4,844	5,672	2,858	10,077	5,531	34,765
1970	2,457,921	7,646	7,045	7,804	3,260	14,986	7,242	47,983
1979	3,343,064	11,292	10,317	10,296	4,132	21,589	10,930	68,556
Percent Growth Since 1950	163%	190%	187%	145%	102%	220%	193%	183%

*Source: Highway Statistics, FHWA, USDOT, various years

**Source: Division of Planning, Missouri Department of Highways and Transportation

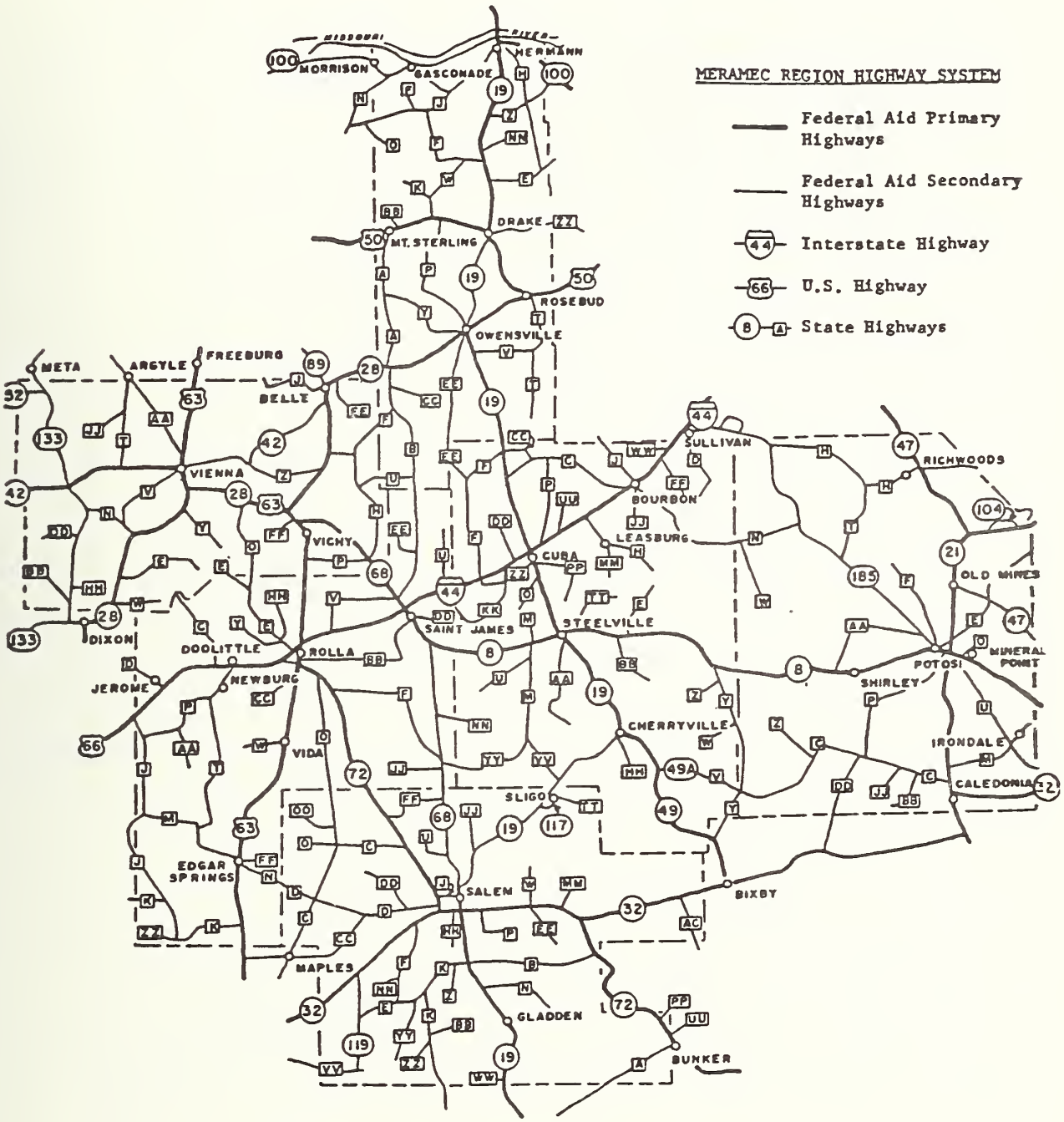


FIGURE 4. MERAMEC REGION HIGHWAY SYSTEM

TABLE 15. HIGHWAY DISTANCE AMONG CITIES IN THE MERAMEC REGION AND TO OTHER METROPOLITAN AREAS

	Belle	Hermann	Jefferson City	Owensville	Potosi	Rolla	St. Louis	Salem	Springfield
Belle		44	65	15	81	27	132	54	137
Hermann			63	29	88	77	117	93	154
Jefferson City				54	121	65	130	91	140
Owensville					66	42	97	64	157
Potosi						65	99	64	179
Rolla							105	29	110
St. Louis								125	220
Salem									135
Springfield									

TABLE 16. CHANGES IN AVERAGE DAILY TRAFFIC FROM 1965 TO 1980 FOR SELECTED RURAL ROADS IN THE MERAMEC REGION

County	Highway Description	1965 ADT *	1980 ADT*	Percent Change in ADT
Crawford	I-44 between Cuba and Bourbon	9,720	12,800	+31.1%
	Mo. 19 between Cuba and Steelville	1,840	3,150	+71.2%
	Mo. 8 between Steelville and Potosi	560	730	+30.4%
Dent	Mo. 32 east of Salem	690	1,230	+78.3%
	Mo. 68 north of Salem	290	600	+106.9%
	Mo. 72 northwest of Bunker	390	640	+64.1%
Gasconade	Mo. 19 south of Hermann	780	1,820	+133.3%
	U.S. 50 east of Rosebud	2,190	3,730	+70.3%
	U.S. 50 west of Drake	1,210	1,550	+28.1%
	Supp. V southeast of Owensville	110	460	+318.2%

TABLE 16. CHANGES IN AVERAGE DAILY TRAFFIC FROM 1965 TO 1980 FOR SELECTED RURAL ROADS IN THE MERAMEC REGION (continued)

County	Highway Description	1965 ADT *	1980 ADT*	Percent Change in ADT
Maries	U.S. 63 north of Vienna	1,460	2,430	+66.4%
	Mo. 89 north of Belle	1,050	1,810	+72.4%
	Mo. 42 east of Mo. 133	320	800	+150.0%
Phelps	I-44 west of Rolla	8,160	10,990	+34.7%
	Mo. 72 south of Rolla	1,720	3,450	+100.6%
	U.S. 63 south of Rolla	1,660	4,380	+163.9%
	Supp. M west of Edgar Springs	430	570	+32.6%
	Supp. H east of Edgar Springs	74	250	+237.8%
Washington	Mo. 47 north of Richwoods	480	620	+29.2%
	Supp. C west of Caledonia	690	1,300	+88.4%
	Mo. 21 between Potosi and Old Mines	2,570	3,610	+40.5%

Sources: Missouri Traffic Map, Missouri Department of Highways and Transportation.

CHAPTER 3. STRATEGIES TO ACHIEVE REDUCED GASOLINE CONSUMPTION

Following the 1973-74 oil embargo and associated gasoline price escalation, several studies have been performed to determine methods utilized to reduce fuel consumption, and to assess feasible strategies that would be desired in the event of future serious shortfalls. Also state energy agencies have in some cases published their energy contingency plans relating to transportation fuels. In order to gain a broad perspective on the fuel conservation strategies that have been implemented, and might be attempted in the future, the following activities were completed during this project:

A. Review of the transportation fuels contingency planning literature.

B. Review of state transportation energy contingency plans.

C. Review of the Missouri Transportation Fuels Emergency Plan.

D. Solicitation of suggestions and materials from professional associations and other agencies.

E. Review of transportation studies recently conducted in rural Missouri.

Also, the following exploratory efforts took place to gather new data during this investigation:

A. Telephone interview with rural residents in the Meramec Region regarding rural trip-making characteristics and fuel conservation.

B. Survey by mail directed to local government officials to determine what actions have been taken to conserve fuel, what actions could be taken in the event of an emergency fuel shortage, and to obtain any other suggestions they might have regarding fuel conservation.

C. Participation in two community-wide attitude surveys, with transportation fuel conservation questions being asked.

Literature Review:

Reports concerning fuel conservation measures and the impact of the petroleum shortage began to appear shortly after the Arabian oil embargo of 1973-74. One of the first evaluations of household responses to gasoline shortages and higher gasoline prices was published by a southeastern Wisconsin Regional Planning Commission (20) in 1976. A mail-out questionnaire was used with 1,461 returns being completed and returned (14.8% return rate). The major findings of this survey with respect to changes in travel behavior between 1973 and 1975 were:

A. Over 75% of respondents made multiple changes in travel habits in response to higher fuel prices.

B. Households made travel habit changes that caused the least disruption to their travel habits (70% of households made one or more of the following changes in shopping behavior: combined several shopping trips, combined shopping and other trips, went on fewer shopping trips, or shopped closer to home).

C. Approximately 50% of the households had changed the type of vehicle they owned, as purchasing an additional small car or to trade a larger car for a smaller car, etc.

D. Over 40% of the households changed vacation plans by primarily cancelling long-distance vacations and taking vacations of shorter distance.

E. Only 5% of the households moved closer to their place of employment.

F. No change in any aspect of travel was reported by 9% of the households.

In the Wisconsin study residents were also asked about their response with fuel use limited to 8 gallons per week. Under these conditions the responses were:

A. Households were much more likely to adopt multiple strategies to conserve fuel than they had previously used.

B. Households favored travel changes that would cause the least disruption to current travel patterns.

C. Changes in shopping behavior would be adopted by more than 75% of the respondents.

D. A strong majority favored altering their vehicle ownership pattern.

E. Respondents were more willing to use carpools and public transportation under restricted fuel availability.

F. Households remained very reluctant to move their residence near to their job.

G. There was a substantial decrease in the portion of households holding the opinion there was no need to make any change.

A study reported by Sacco (21) dealt with suburban residents in Columbia, South Carolina, and their travel habits before-and-after the embargo. An extensive travel study had just been completed prior to the embargo in 1972-73, and it was followed up by a survey of 318 households in 1974, with other travel data being gathered by field observation. It was found that transit ridership doubled for a short time during the period of long gas lines. However, transit ridership moderated quickly as supplies

of fuel became available and the overall change appeared to be an increase on the order of 5.5% to 7.9% in ridership. Highway traffic volumes, however, were found to drop by as much as 12.7% during the weekdays of the most critical month and to have dropped by 25% during the weekend of the most critical month. An evaluation of trip purposes showed that the work trip and the serve passenger trip percentage increased, while shopping, bill paying, school, and other trips dropped. Thirty percent of the survey respondents indicated a "considerable" reduction in the amount of their travel. Respondents to the survey also indicated the relative frequency with which they used certain gas saving methods as shown in Table 17. It is quite clear that driving habits were rather quickly altered (but then the speed limit had been dropped), car pooling was only moderately popular, discretionary trips were reduced, and public transit observed only modest use.

TABLE 17. GAS SAVING PREFERENCES FOR RESIDENTS OF COLUMBIA, S.C.

Method	Used Method to Save Gas (Percent)				
	Frequently	Sometimes	Rarely	Never	Total
Drove slower	88.6	8.8	1.9	0.7	100.0
Reduced shopping and recreational trips	31.4	45.0	12.6	11.0	100.0
Used car pooling	13.6	12.2	10.4	63.8	100.0
Used public transit	0.6	4.4	5.1	89.9	100.0

A study concerned with energy-saving actions was reported by the New York State Department of Transportation in 1977 (22). Overall, New York felt that the best way to save energy in traveling was to encourage use of transit within cities, then to encourage train/bus travel between cities, and finally to encourage people to cut gas use. Transit use was to be promoted by increasing services, reducing fares and providing more protection. The techniques suggested for cutting gasoline use are shown in Table 18. Rural residents agreed with other residents in most highly favoring car pooling, speed limit enforcement and traffic flow improvements.

A study reported by Brewer and Gray (23) in 1977 was concerned with energy conservation actions and their desirability as rated by residents of Iowa. Questionnaires were mailed to households in regions of the state that did not have a city of 50,000 population or more. Results of the 1,398 completed surveys indicated that residents strongly favored policies of uniform speed regulation and were strongly opposed to increased prices as a conservation policy. Also favored were actions such as voluntary reduction of travel, car pool incentives and bus subsidies. Residents of areas

without high-speed highways preferred the rigid enforcement of the 55 mph limit. Overall, a 45 mph speed limit was preferred by 55.1% of those responding to the survey. Younger people were not in favor of severe rationing limits.

TABLE 18. NEW YORK RESIDENTS SUGGESTIONS FOR METHODS TO CUT GASOLINE USE (Percent Agreeing with Method)

Action	Location of Residence			
	New York City	Large Metro	Small Metro	Rural
Incentive for carpooling	91	90	91	90
Enforce 55 mph limit	90	92	93	89
Improve Traffic flow	91	92	89	90
Plan Trips Better	90	88	84	84
Shop Closer to Home	81	86	83	81
Shop Less Frequently	63	71	87	83
Limit Car Size	69	61	48	56
Rebates for buyers of small cars	67	57	46	56
Tax big new cars	62	51	40	46
Ration gas	36	22	36	21
Commuter & parking tax	30	27	18	30
Build more roads	34	29	17	14
Increase gas prices by tax	17	12	8	8

In 1976 the North Central Texas Council of Governments (24) gathered data on local travel behavior changes and public opinions and expectations with respect to transportation energy as a part of an ongoing urban panel survey of residents. A list of selected questions and responses follows:

A. How did the last energy crisis affect your driving habits?

Carpooled	10%	Drove slower	38%
Used bus more	4%	Nothing	25%
Bought smaller car	10%	Other	14%
Took fewer trips	41%		

B. Suppose the price of gasoline were to rise to one dollar or more. I am going to name five options you might consider if this situation occurred. Would one or more of these options be attractive to you?

Carpool more	32%	Move closer to work	9%
Use public transp. more	28%	None acceptable	17%
By a smaller car	30%	Option not mentioned	8%
Change jobs	2%		

C. Gasoline rationing should be enacted if an energy crisis occurs.

Agree 60% Disagree 33% Uncertain 7%

D. One thing a city should do in the event of another energy crisis is to provide Park-and-Ride service.

Agree 86% Disagree 7% Uncertain 7%

E. A city should encourage carpool operations in the event of another energy crisis.

Agree 90% Disagree 6% Uncertain 4%

Quite clearly urban area Texans responded to the fuel shortage by taking fewer trips, driving slower, and they expressed a strong interest in park-and-ride services and carpooling efforts.

New York State has remained consistently involved with the transportation fuel conservation problem since the 1973-74 embargo, and in 1979 the NYSDOT reported an analysis of "Changes in Travel in Response to the 1979 Energy Crisis."(25) Two separate surveys were documented in this report, one known as the "Crossley Poll," and the other as the "State Workers DOT Poll." The percent of respondents indicating that an action has been taken in early 1979, or would be taken under specified future emergency situations is shown in Table 19. Under "Actions Taken" it is clear that "Upstate Residents" had done much more toward combining trips, altering shopping patterns, driving slower, walking or bicycling to work, and keeping the car tuned than had the "State Workers" showed more of a tendency to use public transportation. Under the proposed conditions of higher priced gasoline or limited gasoline, the "State Workers" seemed more inclined to accept almost any conservation measure than the "Upstate Residents", with the exception of walking or bicycling to work.

TABLE 19. FUEL CONSERVATION ACTIONS PREFERRED BY NEW YORK RESIDENTS

Fuel Conservation Actions	Previous Actions Taken		Future Actions if $1.50/gal or 20% less gas	
	State Workers (DOT Poll)	Upstate Residents (Crossley Poll)	State Workers (DOT Poll)	Upstate Residents (Crossley Poll)
1. Combine trips.	35	62	67	60
2. Shop less frequently.	33	45	50	47
3. Keep car tuned.	32	47	65	36
4. Shop closer to home.	27	49	53	47
5. Drive slower.	27	46	57	30
6. Shop on way home from work.	26	30	53	47
7. Buy more fuel-efficient car.	20	22	36	23
8. Take vacation closer to home.	19	25	38	29
9. Use train, bus plane, for vac.	18	14	31	26
10. Carpool to work.	18	18	31	22
11. Take bus or subway to work.	15	5	22	7
12. Cancel vacation trip.	6	19	22	22
13. Cut use of rec. vehicles.	6	15	18	13
14. Walk or bike to work.	5	11	9	13
15. Sell a car	4	12	11	11
16. Get a job closer to home.	2	7	7	6
17. Move closer to work.	3	4	8	4

State Transportation Energy Contingency Plans:

All state energy offices were contacted requesting one copy of each of the following for review:

A. The Transportation Energy Contingency Plan which had been prepared, and;

B. A list of any strategies which could possibly be applied to conserve fuel in rural areas and small communities.

Responses were received from 31 state energy offices. Of these 31 responses, 23 states supplied copies of their plans while 8 others stated they were either just applying for funding to help support their study or their study was in progress. A review of the 23 state plans revealed that 14 had included concepts and/or strategies which might be appropriate for rural areas and small communities. None of the state plans contained a specific set of recommendations especially developed for rural areas. Most respondents believed that the rural area fuel emergency problems needed to be explored. Six states sent supplementary materials and reports which were useful.

Many of the state plans contained very similar strategies. Therefore, a summary of all plans will not be included in this evaluation, but rather excerpts from certain plans will be quoted, in particular for those strategies which might have application in rural areas and small communities.

RHODE ISLAND: The Governor's Energy Office is focusing emergency planning efforts on five areas. They are:

1. Preparation of an emergency transportation program with Rhode Island Public Transit Authority.

2. Park-and-Ride emergency expansion/intensification of ridesharing efforts.

3. Impact analysis of potential Emergency Energy Conservation Act measures.

4. Governor's Energy Office in-house organization.

5. Increased grass roots support through municipal energy coordinators.

Also included in the Rhode Island plan was a listing of currently used commuter parking lots and other existing lots which could potentially be used for commuter parking sites.

NEW MEXICO: Strategy 2, Ridesharing/Vanpool Promotion. This measure is to encourage the use of more energy-efficient transportation as an alternative to the single-occupant automobile. The commuter has the greatest potential for gasoline conservation.

Strategy 4, Emergency Response Plan for Employers: Agencies and businesses, both public and private with over 50 employees, would develop their own emergency plans which would be most adaptable to their specific organizations. Possible strategies might include: Flextime, Rideshare/ Vanpool, Building temperature restrictions, Compressed Workweek and Public transportation...The Energy and Minerals Department would help employers in developing their response plans through various suggested strategies and workshop.

Strategy 6, Project 50: This measure is essentially the same as Project 55 except that the speed limit would be dropped from 55 mph to 50 mph.

Strategy 7, Public Transportation: This measure is to make use of school and tour buses, vans, reserve buses and contracts with private carriers to increase transportation efficiency during a gasoline shortfall.

A document entitled "Statewide Program Plan for Fuel Conservation of Motor Vehicles: accompanying the New Mexico "Emergency Motor Fuels Conservation Plan" included the following recommendation: In conjunction with State Highway Department, appoint local rideshare coordinators in communities with population of 10,000 or more (approximately 15 of them) and train them in developing contingency ridesharing plans and in matching techniques.

KANSAS: Vehicle Inspection. Under the provisions of this measure, motor vehicle owners would be requested or required to have their vehicles inspected periodically in order to insure that each vehicle is operating in an energy-efficient manner.

Prohibit or Restrict Driving To and From School: Implementation of this measure would result in the curtailment of driving to and from school by high school students. Students would be encouraged to use existing school bus or public transportation facilities, or if driving is absolutely necessary, to carpool.

School Schedule Modification: There are a variety of ways in which school schedules could be modified, such as through the imposition of a four-day week, or extending vacations.

MAINE: Voluntary Ridesharing Effort. Voluntary conservation efforts will form the cornerstone of all attempts to reduce gasoline consumption in Main...First, the Governor will convene a conference of all major employers as well as representatives of shopping malls, business districts and other organizations attracting large groups of commuters...Successful carpool and vanpool programs will be described by participating employers and organizations. Local Rideshare Task Forces will be created to promote and develop programs at the local level...Second, the Governor will enlist the active assistance of the media. Radio stations will be asked to provide daily 'Rideboard' time on the air. Newspapers will be asked to devote space in classified sections for carpool and vanpool riders/drivers 'ads'...Third,

local governments will be asked by the Governor to provide rideshare matching assistance to commuters on an ad-hoc basis. This may involve such efforts as establishing call-in telephone matching services administered by city or town officials.

Furthermore, the "Main Rideshare Program Update" describes the following activity: 'Park-and-Ride Areas.' An important promotion tool and substantive service, park-and-ride lots are becoming an important part of the rideshare program. To date, informal arrangements have been made with churches, cinema centers and shopping malls to allow groups to meet to form pools. Much more pressure must be brought to bear to encourage the formal dedication of park-and-ride lots by state and municipal governments in the future.

FLORIDA: "Energy Emergency Management Structure"...County Fuel Allocation Officers and Area Fuel Allocation Offices will assist the Petroleum Allocation Group as needed.

·Area Energy Emergency Fuel Councils in each of the state's four civil defense areas will be appointed by the Area Fuel Allocation Officer to assist in ensuring distribution of available energy fuels; coordinating support and assistance between wholesale purchasers-re-sellers, whole purchase-consumers, and end users; and furnishing information on the local energy supply situation to the Governor's Energy Office.

·County Government, through the chairman of the County Commission, will be considered by the state as the primary unit of local government for implement action of contingency needs during a shortfall or emergencies.

"Emergency Response Guidelines"...Public Education Programs on Fuel Savings--Extensive use of the media for public education will assist in improving usage patterns and conservation. Prepared programs and public service announcements will provide information on obtaining increased efficiency from present modes of travel, particularly auto travel.

"Mandatory Automobile Inspections"--This measure involves requiring motorists to have an engine "tune-up check" as part of regular inspections through the existing Motor Vehicle Inspection Program. Vehicles failing to meet tune-up standards would be required to have engine tune-ups before an inspection sticker would be issued.

WASHINGTON: In addition to providing the "Washington State Petroleum Products Contingency Plan", an excellent document entitled "Guide to Local Transportation Contingency Planning" was also sent. Under their "Ride-sharing" program option the following comments appear:

"Carpool Programs". Carpool programs can be difficult to get started. This is one reason why there are so few of them...The real importance of carpool programs is that they assure that people can get to work in times of an energy shortage. This means that employers are also suddenly in the

transportation business. It is in their best interest to cooperate in carpooling efforts. For a quickly established program for local employers, we suggest use of ride-matching display boards which cost about $100 each to construct. These boards have been successfully used at WSDOT headquarters in Olympia. Essentially, the board is a zoned map of the community; it uses cards where the employees can indicate the district in which they live. Then it is left up to the individual employees to get themselves matched up. A company can greatly facilitate this carpool matching process if it appoints an internal coordinator. Boards of this type are successful because they focus on a particular work site where people tend to already know each other. Private employers can also use their vehicle fleets as fleetpools, much like public sector fleets are used. Candidates for private fleetpools can be identified from the employer inventory.

"Emergency Park-and-Ride Lots." Park-and-ride lots help encourage ride-sharing. These are sites where commuters can park their cars and ride to work together, thereby saving fuel. Some communities have established formal lots. In other places, park-and-ride lots are ad-hoc creations. We suggest that, prior to a shortage, you identify unused parking lots in strategic outlying areas of your community which could easily be converted to park-and-ride lots. For example, churches make excellent sites because they have empty lots during the week. Make a list of all churches that are potential sites and contact the church officials prior to a shortage. You can add to this list with other suitable sites; e.g., vacant lots, shopping malls, etc.

During a shortage, the communciation network should be used to inform the public of the existence of these lots and their locations. Some of the lots can be used for carpools; others near the transit lines can be served by bus.

"Use of School Buses/Revised School Hours." Your community probably has many more school buses than transit buses. Potentially, these school buses could be used to augment the normal transit system. We encourage you to explore this possibility with your local school officials. In 1981 there will be an effort to settle the policy questions involved in this matter at the state level, and you should monitor that effort via WSEO or WSDOT. Use of school buses as auxiliary transit buses raises a host of legal and contractual issues including laws governing school hours, teaching contracts, driver union contracts, etc. If you have not resolved these issues prior to a shortage, then it will be extremely difficult to use your school buses during an emergency. The issues are too complex to settle in the short-term.

"Restrictions on Student Parking." Generally, there is no necessity for students to drive to school. They can either walk or take the bus, as the rest of their classmates do. Therefore, working with school officials, you might choose to ban parking on school property by students in a move to discourage discretionary student driving. A simple exception system could be set up for students who must go straight to an after-school job which precludes them from taking the bus. It will be easier to get cooperation if

student representatives participate in deciding this issue. These students can help consider alternatives to driving.

"Change in Traffic Lights." Traffic studies have shown that the more constant the flow of traffic, the less fuel is consumed. Obviously, fuel efficiency is not the overriding consideration regarding traffic flow; safety is. We recommend, however, that your community's traffic engineers identify traffic lights in your area that could be put on a flashing basis, rather than the normal stop-and-go pattern, without endangering public safety. While not all lights can be treated in this fashion, there are many, particularly late in the evening, that could serve in a more fuel efficient capacity. Depending on your system, it may also be possible to set the lights in synchronized patterns to facilitate the flow of traffic.

"Subsidized Bus Passes." Employees who regularly make business trips around the city should be encouraged to use the bus rather than checking out a car from the motor fleet or using a private auto. The transit operator can probably be persuaded to make books of tickets available to employers at a discount rate to encourage this practice, as they have in Seattle.

"Alternative Work Hours." Another energy saving technique is flextime or staggered work hours. With flextime, employees are able to start work earlier or later than the standard starting hours. The effect of this on the transportation system is that it "spreads out" the peak hour traffic, and thus allows for greater use of public transportation. It also cuts down on traffic congestion which saves gasoline. According to studies, variable work hours also result in decreased absenteeism, improved productivity, and the virtual elimination of tardiness. Rather than leaving the choice to individual workers, some employers might consider staggering their entire work shift. That is, they can move the starting time from 8 to 6 or from 8 to 10 for the whole staff. This, too, would help to spread the peak of local traffic patterns and allow for optimal use of the transit system. During an extreme fuel shortage, major employers should consider going to a compressed work week of four ten-hour days. With this change employees only need to travel to and from work four times a week rather than five times, yet they still work the same number of hours. We don't recommend a compressed work week to save gas unless there is a <u>severe</u> shortage.

Under the "Driving Techniques" program option the following comments appear:

"Fuel Efficient Driving Techniques." A program of highway vehicle maintenance and driving techniques that emphasizes fuel efficiency can obtain considerable savings of motor fuel. For example, surveys reflect that the average time is underinflated by 4 psi. The simple art of inflating tires up to recommended maximum pressure can increase fuel economy by 2-5 percent. Other equally simple techniques can be done now on a cost saving basis, to provide additional savings for individuals and fleet managers. Pamphlets describing these techniques are available from WSEO. The U.S. Department

of Energy is sponsoring the Driver Energy Conservation Awareness Training Program (DECAT). Under this program, fleet managers or their representatives are taken to a Nevada training site for a short course of instruction. The DOE estimates that organizations participating in this program are realizing fuel savings of 5-15%.

"Strict Enforcement of Speed Limits." Lower highway speeds lead to lower fuel consumption. If there was full compliance with the existing 55 mph limit, motor fuel consumption would be reduced by 2 percent. During a fuel shortage, local officials could lower speed limits to obtain additional savings. For example, if speed limits were lowered to 50 mph, and 100% compliance was obtained, fuel consumption could be reduced by an additional 4 percent.

"Restrictions on Vehicle Idling." Allowing a warmed-up vehicle engine to run when the vehicle isn't moving is a waste of fuel. Municipal regulations can prohibit the idling of municipal vehicles for periods of longer than one minute. Encouraging the public to shut down the engine at long red lights, railroad crossings, drive-in bank lines, service station lines, etc., can make a contribution to saving fuel. The city of Spokane passed an anti-idling ordinance in the spring of 1980.

IOWA: "Sponsor Vanpool Program." The Iowa Energy Policy Council would purchase vans to be leased to companies or groups of employees on an application basis. Requirements could include that the service be subscribed to by employees, that other forms of transportation are inaccessible, etc... Alternately the Energy Policy Council could subsidize (25%-50%) of employer van purchases for employee van pooling on an application basis.

"Prohibit Single Occupant Vehicles." At least ten days before implementation it would be announced that passenger automobiles and trucks under three tons carrying only the driver would be banned from truck roads, arterials and interstates between the hours of 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. Lists on maps of roads in the above classifications would be printed and distributed to the news media and the enforcement agencies involved.

"Restrict Driving To and From School." The Energy Policy Council would work with private schools, the Department of Public Instruction and the Board of Regents to reduce vehicle use in travel to and from school by fifty percent for all post elementary institutions. Each institution would be instructed to draw up a plan to meet the goal within 30 days and would have 30 additional days to achieve the reduction. Plans could include: reducing parking spaces and restricting students to parking in the lot, assessing high parking fees; actively promoting car pooling, etc.

OHIO: In organizing their fuel conservation measures Ohio indicated if the strategies would be implemented by the state government, local government and/or businesses. Each measure was identified with the symbol S, L and/or B to indicate the implementation responsibility.

"Public Information Measures:"

Local Information Centers (L) - To coordinate local information dissemination and to respond to end user questions and concerns, local government organizations shall be encouraged to maintain an accessible Emergency Information Center. Such centers are expected to serve as focal points for community questions, conservation measure information, reporting of hardships, etc. Many local agencies currently maintain local information capabilities which could be expanded to include information needs inherent with the local energy emergency.

State Information Center (S) - During any energy emergency the State of Ohio shall operate a central information dissemination center providing technical assistance to the local governments, business and end users. The State Information Center will include expansion of current conservation measures, public hotline operation, and consumer response mechanisms. In addition, the State Information Center, in cooperation with ODOE, shall gather necessary information on conservation targets, achievements via conservation goals, and the reporting perceived barriers to effective energy conservation during the emergency.

State and Local Emergency Operations Center (L, S) - Under Ohio Emergency Rules for Fuel Shortages, as adopted June 13, 1978, the Ohio Adjutant General's office may establish and maintain a central emergency operations center and county emergency centers to plan the necessary administrative and logistical capability to support delivery of and to provide security for the movement of transportation fuels to designated priority uses where life, property, health, or safety are threatened. These emergency operations centers may be established within or in conjunction with the Local and State Information Centers. The primary role of these emergency centers is to ensure that priority users are not subject to unnecessary hardship during the energy emergency.

Public Transit Hotlines (L, B) - Transit authorities serving the Ohio areas shall be encouraged to advertise and provide a hotline service design to meet the needs of new riders. Particular emphasis is to be given to expansion of existing hotline services to ensure that all potential riders receive timely and accurate information on transit services. These hotlines may be combined with other services designed to increase public awareness of transit routes, time tables, fares and the economic advantages of utilizing mass transit.

Public Information Campaign (L, S, B) - It is recognized that implementation of EECA measures and the voluntary consumption by individual gasoline users will be subject to such users belief that an emergency actually exists. To this end, it is imperative that information regarding the nature and extent of the emergency reach the general public in a timely and accurate manner via mechanisms which enjoy a high degree of credibility from the public. Local, state and business entities involved in energy emergency planning and EECA measure implementation must coordinate an extensive

and credible public information campaign to assure adoption of voluntary EECA measures. This campaign must be a coordinated effort jointly by the Governor, ODOE, local EECA agencies, business and national energy officials.

"Public Transit Measures:"

Vehicle Substitution (L) - To increase efficiency of gasoline and diesel usage substitution of smaller buses or other high occupancy vehicles on lesser used routes is to be encouraged for the period of the emergency. Vehicle substitution would make larger buses available for use on high priority-high ridership routes.

Supplements to Priority Routes (L) - Local Transit Authorities during the emergency are to be encouraged to supplement high-ridership routes with extra buses and those freed by substitution of smaller buses on lesser used routes.

Park-and-Ride (L, B) - Transit authorities, particularly those servicing heavy commuter traffic are encouraged to expand park-and-ride facilities throughout their service area. This may include the establishment of temporary park-and-ride sites along various commuter routes. Such temporary park-and-ride sites may be a place at churches, shopping centers, and certain other parking lots which may not be fully utilized during the day. Transit authorities should make concerted efforts to service such park-and-ride facilities with both priority service to central areas, as well as with feeder services to the park-and-ride site. Local government agencies may assist the transit authority in determining suitable sites for both temporary and permanent park-and-ride facilities. Certain businesses may be able to suggest lots or provide sites for these facilities on a temporary basis.

Reduction of Empty Runs (L) - Transit Authorities must make every effort to reduce or eliminate the driving of empty buses. This reduction might include overnight storage of buses at points on individual routes removed from the central garage facilities.

Alternative Fare Schedules (L) - Transit Authorities are encouraged to consider reduction in fares for off-peak service and other financial incentives to increase ridership during the emergency. Such considerations might also include special treatment for express services, commuter services, weekly or monthly passes, and tickets or tokens.

Employer Transit Passes (L, S, B) - Employers are encouraged to participate in a subsidization of transit passes or tokens for their employees. Employee transit passes could be purchased from transit authorities on a contractually arranged reduced basis, with savings passed along to employees. Employers might also choose to directly subsidize those employees who purchase transit passes or tokens on their own. In either case, the objective is to have an employer-based incentive for use of public transit. The employers gain an assurance of attendance, and lessen the possibility of employee absence due to lack of transportation fuel.

Transit Passes in Lieu of Parking (L, S, B) - Employers who provide subsidized or free parking to employees are encouraged to replace those parking subsidies with transit passes or tokens for employees.

"Paratransit Measures:"

Carpool Formation (L, S, B) - Employers in local and state agencies shall encourage formation of carpools. Among residents and employees, carpool formation may be enhanced by implementation of certain other EECA measures, including the availability of alternative working schedules as incentives for carpool parking.

Vanpool Formation (B) - Employers shall be encouraged to form vanpools for their employees either through lease or purchase of vans for employee commuting use. Information on formation of vanpools shall be provided through the State and Local Information Centers. Demonstration of vanpool success at other locations within the state should help expedite formation of new vanpools. Incentives might be offered which include alternative working schedules and parking privileges for vanpool participants.

Carpool Matching Service (L, S, B) - Certain state and local agencies currently provide services to individuals interested in establishing carpools. These services are generally provided free of charge and consist of an information collection retrieval and referral service. These services are expected to become even more important in time of a transportation fuel emergency.

Jitney Service (L) - During an energy emergency jitney service, i.e., taxi service limited to fixed routes or zones with permitted shared rides, should be a considered option. Particularly with regard as a feeder service for conventional transit systems, jitney service could be provided in neighborhoods with a final destination of a park-and-ride stop or other central gathering location for transit authority riders. Jitney service could also be authorized for high priority transit routes, particularly to augment service after normal service runs have been completed.

Multi-passenger Taxis (L) - Local prohibitions on the allowance of multi-passenger and/or multi-destination taxi trips would be temporarily suspended to allow maximum efficient use of this transit-mode. Any other local prohibitions on taxi service which interently promote empty or inefficient trips should be suspended for the period of the emergency.

School Bus Use (L) - Public transit systems could be augmented to use of school buses under lease during times when school systems would not be using them. This might include extra buses in school fleets or buses available during school vacations. School buses could be used to supplement priority routes, run on lesser used routes, or to serve neighborhoods as a feeder system to conventional transit systems.

Private Bus Use (L, B) - Certain churches, apartment complexes, businesses and other owners may have buses which might be capable of augmenting normal transit systems in a manner similar to that presented for school buses. Advantages with private buses include less statutory restriction on use for public transit purposes and greater availability.

"Transportation Systems:"

Lower Speed Limits (L, S) - During the emergency, posted speed limits on public highways, thoroughfares, state routes, and county roads, may be reduced to enhance fuel conservation. Local and state law enforcement agencies will be encouraged to enforce strictly these temporary lower speed limits.

Limiting Fleet Vehicles Speed (S, L, B) - Fleet operators, including government and businesses, shall be urged to require operation of their fleet vehicles at speeds no greater than 50 m.p.h. for the period of the emergency. This voluntary reduction in fleet vehicle speed should set an example for other Ohio drivers.

Traffic Signal Alternations (L, S) - For the period of the emergency, state, county and local traffic control agencies would be urged to increase traffic flow efficiency by changing unneeded stop lights to flasher and/or by timing stop lights to increase flow of traffic. No lights necessary for the safety of drivers or pedestrians would be changed, nor those lights necessary for the safety of drivers or pedestrians would be changed, nor those lights necessary for the safe crossing of school children across major traffic thoroughfares.

Elimination of On-Street Parking (L) - Local governments would be encouraged to reduce or eliminate on-street parking during rush hours. Elimination of such parking availability would lead to an increase in average speed of traffic flow and decrease use of single occupant commuter vehicles through parking disincentives.

Parking Incentives for High Occupancy Vehicles (L, S, B) - Employers and parking lot managers would be encouraged to provide incentives for high occupancy vehicles such as car or van pools, by providing subsidies or preferred locations for parking of such vehicles. Such incentives might be accompanied by equal disincentives for parking of low occupancy vehicles, such as increased parking fees or less desirable location.

Raise Load Limits (S) - During the emergency, the Governor would request the temporary raising of mandatory laod limits on state roads, particularly for vehicles engeged in the delivery of transportation fuels and essential commodities. Similarly, restrictions on the length of such vehicles could be temporarily lifted.

Drive Throughs (L, B) - Businesses operating drive-in or drive-thru facilities would be encouraged to restrict drive-thru operations for the

period of the emergency. Alternatively, operators would be requested to post signs reminding drivers in line to shut off motors if the wait is going to be of sufficient length to justify such.

Alternative Travel Model Incentives (L, S, B) - All Ohio employers would encourage employees to use any means possible to commute to work which would result in a reduction of their personal gasoline usage. These might include incentives for the use of bicycles, or walking, using mopeds or motorcycles, skates, etc. Incentives might take the form of a monetary reward, certificates of recognition, notations on personnel files, or other forms. Employers would also be encouraged to accommodate flexible work suchedules for participating employees.

"Fuel Supplier Measures:"

Announcements of Open Stations and Hours (L, B) - Local media and energy information centers shall be encouraged to maintain a log of retail gasoline stations and their anticipated operating hours. Such hours are to be announced via the local media or made available on energy information hotlines to consumers requesting such information. Implementation of this measure should alleviate unnecessary driving in search of open retail gasoline stations.

Sidewalk Available Supply Notice System (L, S, B) - Retail suppliers shall be encouraged to display an announcement of available gasoline supplies in a location and in a manner that is noticeable by drivers on the street.

Tire Pressure Campaign (L, S, B) - To encourage vehicle operators to maintain proper tire air pressure, retail gasoline stations shall be encouraged to check tire pressure on vehicles at full service pumps, provide free air for tire inflation, and to provide tire pressure gauges for use at self service pumps.

Vehicle Maintenance Campaign (L, S, B) - Retail service stations will be encouraged to participate in a coordinated state/local/business campaign to encourage proper maintenance of vehicles. This might include participation in statewide advertising campaigns, offering of special maintenance discounts on sales, extension of operating hours of gasoline pump operations, and other activities.

"Transportation Fuel Users:"

Decreased Driving to School (L) - Local school boards and individual school principals will be encouraged to decrease commuting by students who have other forms of transportation, including regularly scheduled school bus service. Students who need vehicles to participate in extracurricular activities, or for employment, would be exempt from this measure. Driving decreases may be accomplished through disincentives such as establishment or increase of current school parking fees.

Taking Most Fuel Efficient Vehicle (L, S, B) - Drivers and fleet operators would be encouraged to make use of the most fuel efficient vehicle available to them for any given trip.

Fleet Vehicle Passenger (L, S, B) - Vehicles owned by business or government should be permitted to carry non-employees destined for the same area. Such a procedure would allow maximum use of carpools for commuting employees. Implementation of this measure may be constrained by legal or regulatory restrictions, or by questions of liability. However, those vehicles which are not subject to such restrictions should be permitted to carry non-employee passengers during an energy emergency.

Rescheduling of Special Events (L, B) - Sponsors of sporting and other special events would be encouraged to schedule such events to correspond with other simultaneous or successive events. For example, schools may be encouraged to schedule sporting events normally held during evenings or on weekends immediately after school.

"Alternative Work Schedules:"

Flextime (L, S, B) - Employers would be encouraged to allow their employees to alter working hours slightly to make it more convenient to carpool and to alleviate traffic congestion during rush hours. The degree of schedule alternations shall be left to the employer, but it is envisioned that "flextime" opportunities shall be offered as an incentive for employee carpooling.

Compressed School Week (L, S) - Local education boards, and their schools, would be encouraged to compress their hours of operation by limiting weekend activites. Hours of operations either daily or weekly may also be compressed.

Compressed University Schedules (L, S) - Universities, colleges, technical schools, and other institutions of higher education would be requested to compress their operations reducing or eliminating certain weekend or evening activities, or compressing class schedules.

Working At Home (L, S, B) - Where possible, employers would allow employees to complete their work tasks at home, commuting to the office to submit completed projects and pick up new assignments. Certain educational studies could also be completed at home to alleviate the need for an extra day of driving to schools and universities.

Shortened Business Hours (B) - Retailers and other businesses would be requested to curtail less profitable hours or days of operation. For example, neighboring businesses might collectively eliminate the first or last half hour of a business day to make their operating hours compatible. This measure would help promote increased trip planning among customers, suppliers and others who frequent the business.

MICHIGAN: Accompanying the Michigan Gasoline Shortage Response Plan was a study from the University of Michigan entitled "Analyses of Emergency Gasoline Conservation Options" which was in draft form. The University of Michigan study provided a detailed evaluation of the Mandatory Carless Day Sticker Plan, the Plan to Extend Days Between Gasoline Purchases, the Gasoline Tax/Rebate Program, and Ridesharing as a Short Term Energy Conservation Strategy. This document points out that during a serious gasoline shortage, ridesharing may be the only positive option available to many commuters. Furthermore, it is suggested that the computer matching systems would not be especially effective during a gasoline crisis situation. It is recommended that "do-it-yourself" matching at the neighborhood level be emphasized for establishing car pools and vanpools. Each community would have an officially designated coordination center, probably staffed by volunteers. Standardized forms would be available, and "ride boards" similar to that utilized at many universities would be required. Neighborhood ridesharing resource persons should be appointed, and explanatory materials printed for distribution.

NEBRASKA: "Voluntary Motor Vehicle Efficiency Testing Program, Automobile Energy Efficiency." The Nebraska Energy Office is leasing a van and equipping it with an automotive diagnostic center. The van will travel throughout the state and perform analysis on automobiles to identify various energy efficiency problem areas. The anticipated energy saved is between 10 and 20% per auto.

The Nebraska Energy Office also telephoned to inform us that one of their policies on fuel allocation was to assure any gas station in a community with only one gas station that it would be guaranteed a supply of fuel sufficient to avoid running out.

COLORADO: Correspondence accompanying the "Colorado Motor Fuel Shortage Contingency Plan" indicated that preliminary efforts had been initiated to coordinate cities and counties into a state conservation and contingency plan. Under a Severe Shortage condition, the Colorado plan calls for these state measures:

A. Expansion of ODD/EVEN purchase measures to every 3rd, 4th or 5th day purchase.
B. Sunday closing of retail stores.
C. Reduce 55 m.p.h. speed limit to 50 m.p.h.
D. Mandatory vehicle tire inspection.

Also attached to the Colorado Plan was a report prepared by the Colorado Energy Research Institute entitled "Policy Alternatives to Reduce Transportation Energy Consumption." Only several of the 57 suggested alternative actions will be listed here:

A. Retrofit existing vehicles.
B. Inspect vehicles for fuel efficiency.
C. Optimize traffic signal timing.
D. Upgrade traffic signal systems.
E. Remove unwarranted traffic control devices.
F. Put traffic signals on "Flashing Yellow."
G. Maintain pavements intensively.
H. Restrict on-street parking.
I. Improve alignment at selected locations.
J. Sponsor car and van pools.
K. Provide more park-and-ride facilities.
L. Sponsor paratransit modes.
M. Encourage walking.
N. Encourage bicycle use.
O. Encourage gasohol development.

NEVADA: A partial list of the "Proposed Conservation Measures for the State of Nevada's Emergency Energy Contingency Plan" for "Efficiency Improvement" follows:

"Satellite Parking." It is our belief that satellite parking would facilitate achieving fuel savings...While it would generally take time to purchase and develop facilities as permanent satellite parking lots, existing parking lots could be utilized for satellite parking in a short-term emergency.

"Flexible Ridesharing." This measure has been operating from Novato to San Francisco as "Commuter Connection" since March, 1979, and has recently been considered for implementation in other U.S. cities. (Commuter Connection is a non-profit corporation backed by local, state and federal agencies. It is basically an informal system of ride pickups. Commuter Connection tries to maintain security precautions by taking two I.D. photographs keeping one on file and putting theother on an ID card-and by verifying workplace and residence).

"Changed Work Hours." Flex-time and staggered shifts would have no particular impact on gasoline consumption, as work trips would remain the same...A work week comprised of four ten-hour days would impact gasoline in that work trips would be cut by 20%.

"Drive-Up Window Ban." It has been suggested that gasoline is wasted by cars idling while waiting in line at drive-up windows at banks, fast food facilities, fotomats, and other such businesses. This could be controlled by an outright ban on new drive-up facilities, a restriction on vehicle idling in general, a restriction in the length of lines allowed at drive-up facilities, or an emergency ban on the use of drive-up windows... Beyond the actual savings in fuel, there could be psychological benefits in the elimination of appearances of waste.

"Speed Limit Enforcement/Change." Changing the speed limit to 50 or 45 m.p.h. (from 55 m.p.h.) would result in a savings of 4.7% and 9.0% respectively for high speed traffic, or a net savings in gasoline of 2.4% for 50 m.p.h. and 4.6% for 45 m.p.h.

Missouri Transportation Fuels Emergency Plan:

The "Missouri Transportation Fuels Emergency Plan" (MTFEP)(6) is the basic contingency planning document that would guide our state government, municipalities, other government agencies, and the private sector in responding to any significant shortfall in our gasoline supply. The MTFEP was published in September, 1980, by the Division of Energy in the Missouri Department of Natural Resources, with the principles, administrative procedures, task assignments and measures taken from their draft "Missouri Energy Emergency Plan." Subsequent to the publication of the MTFEP, we have had major changes in the Executive branch of both our Federal and state government. It is quite likely that the MTFEP will be revised in the near future, if funding is provided for such an endeavor, and the policies of the new administrations will be reflected in the modified plan. Since the September, 1980 MTFEP is the only contemporary document specifying actions to be taken in a transportation fuels shortage, it will be examined in detail with special attention given to the potential impact of fuel conservation measures on rural areas and small cities in Missouri.

The MTFEP is designed to meet several levels of gasoline shortfalls, with four following phases of action being established:

(1) Phase I - Prior to Shortage. "Phase I is currently in effect and will continue as long as any energy shortages or probable or imminent on a volume scale that will adversely affect the health, safety and/or welfare of the citizenry of any political subdivision."

(2) Phase II - Mild Shortage. "The precise level of shortfall associated with Phase II for each energy source may vary, but in no case will it exceed ten percent of local unconstrained demand.".."Even when the national shortfall is low, certain states or regions may feel severe impact of an energy fuel shortage."..."During a mild shortage, the federal and state functions include: answering public inquiries, monitoring the federal and state voluntary measures, and evaluating changes in the supply situation. Special federal and state data collection procedures will be implemented to investigate actual or potential local shortages during this phase."

(3) Phase III - Moderate Shortages. "Shortfalls which locally exceed ten percent of unconstrained demand will be considered moderate."..."Emergency transportation measures will be utilized when local shortfalls occur. All units and functions of the Energy Emergency Management Information System (EEMIS), the Energy Liaison Center (ELC) and the Missouri Energy Emergency Center (MEEC), will be implemented. (EEMIS will monitor the supply/demand situation on an appropriate and timely basis.) Some of the procedures to be implemented are: increase frequency of supply and demand

status reports, and implement new information systems to support specific measures implemented during Phase III."

(4) Phase IV - Severe Shortage. "Severe shortfalls which exceed ten percent of national unconstrained demand may trigger the implementation of relatively extreme measures by the state and federal government. At severe shortfall levels, it may be desirable to allocate supplies to reduce economic impact as well as preserve health and safety, and implement extreme mandatory demand restraining measures. The President can request Congress to implement the Standby Gasoline Rationing Plan when he has determined that a national energy supply shortage has resulted or is likely to result in a 20 percent shortfall, with respect to projected normal demand of gasoline and middle distillate fuels for a period of at least 30 days. During Phase IV, all units of EEMIS, ELC and MEEC will be operational and functioning at or near maximum capacity."... "During all phases, maximum effort will be made to provide adequate supplies for essential or critical services and uses. These would be defined as including those facilities whose function is necessary to the support of life, e.g. hospitals, nursing homes, iron lung and kidney machines; facilities necessary for national, state or local security, e.g. missile sites, defense communication network centers, civil defense facilities, and prisons; and facilities necessary to provide essential public services, e. g. police and fire control, water, telephone, gas, sewage, transportation, communications, food processing and distribution, medical supplies, coal mining and petroleum refining and pipelines."

Missouri Transportation Fuels Emergency Plan Implementation:

Implementation of the MTFEP necessitates interactions among many different segments of government and the private sector. As stated in the September 1980 plan, the organizational components are as follows: "information and analysis; advisory; decisionmaking, and implementation."

"The information and Analysis component is continually in operation. The primary responsibility for this component is given to the Missouri Energy Emergency Center, (MEEC). All state departments are assigned tasks including subjective analysis of the local situation by field personnel, monitoring the departments' own energy usage, energy data collection and other forms of information gathering. The MEEC will also receive information from federal sources including the Energy Emergency Management Information System, other states and private organizations. During a Phase II shortage, more detailed local information will be provided by the County Energy Emergency Panels and coordinated by the Regional Planning Commissions for transmittal to the MEEC. All of this information will be analyzed and reported to the advisory component and the decisionmaking component. Once an energy resource emergency is declared by the Governor, information release by private sources can become mandatory."

"The Advisory Component is the Energy Advisory Panel (EAP) consisting of state officials and others who are knowledgeable in the affected area. The directors of the Department of Natural Resources, Office of Administration, Public Service Commission and Disaster Planning and Operations Office are core members. The Governor appoints the remainder of the panel. The EAP requests and receives information from the MEEC including a list of potential response measures. The Governor also has the option of using advisors from outside state government including industry, commerce, utilities, energy suppliers, educational institutions, consumers and others. Proposals and related information will be submitted to the decisionmaking component for final approval."

"The Decision-making Component is responsible for establishing policies to be implemented and the procedures for doing so. By law, the Governor has this responsibility during an energy resource emergency. It is anticipated that the Governor will consult with key legislative leaders as well as the Energy Advisory Panel when finalizing response measures. All public statements concerning the emergency will come from the Governor's office. The decision to declare an emergency, by law, must be made by the Governor or the General Assembly as a whole. Emergency response measures are primarily the responsibility of the Governor."

"The Implementation Component will be directed by the Governor to put response measures into effect. The Department of Natural Resources - Division of Energy will have the primary responsibility for implementing energy related policy actions. The Disaster Planning and Operations Office, in cooperation with the Division of Energy will be responsible for implementing policy actions designed to alleviate the impact of the energy emergency on general living conditions and public health, safety and welfare. The functions of Disaster Planning and Operations Office are not expected to be utilized until the latter stages of Phase III or in Phase IV. Until that time the Department of Social Service, local governments and voluntary agencies will provide the needed assistance."

It is clear that implementation of the MTFEP involves several possible stages with numerous levels and branches of government becoming involved. In a fuel emergency, the President could set State-level gasoline consumption targets, implement a rationing plan, and either retain or discard a set-aside program for high-priority users of gasoline. In any event the Department of Natural Resources - Division of Energy will be the responsible group to "work with local governments and other groups to provide maximum assistance to the citizenry. All major announcements and decisions will be released by the Governor's office while DNR-DE will be responsible for public education and distribution of information on emergency measures. The Department of Social Services, the Diaster Planning and Operations Office and the Division of Employment Security are given responsibilities for public assistance. Mass transit systems' responsibilities are in the area of maintaining or augmenting their capacity to serve increased work trips, assisting in reducing auto travel, coordinating para-transit services, and educating the public."

Missouri Transportation Fuels Emergency Plan Relief Measures:

The MTFEP contains a set of relief measures designed to achieve reductions in gasoline use according to the severity of the shortfall. Some of these measures would be implemented at the State level with little or no interaction necessary with local governments. Other measures are oriented toward gasoline distribution and sales policies at service stations, with lines of communications established between the Division of Energy and those in charge of the petroleum distribution network. Certain measures are much more oriented toward the individual and his life style, with a high level of cooperation being essential to achieve the goal of gasoline conservation. The complete set of fuel conservation strategies from the MTFEP is listed below:

A. Reduced Transportation Fuels Consumption by State Government

B. "More Missouri Per Gallon" Public Information Campaign

C. Ridesharing Program

D. Driver Energy Conservation Awareness Training Program

E. Reduced Transportation Fuels Consumption by Local Governments

F. Minimum Purchase and Flag Program

G. Odd/Even Purchase and Flag Program

H. Daily Sales Limits and Staggered Operating Periods

I. Liberalization of State Regulations on Truck Weights

J. Vehicle Speed Limitations

K. Truck and Automobile Fleet Energy Management Program

L. Mandatory Sticker Plan

Since fuel conservation measures A, I and J primarily depend on State government actions and responses, they will not be evaluated in this study. Measures F. G. and H are concerned with state government and petroleum distribution policies, are not strategies that would be influenced substantially by local governments, and they will therefore not be assessed in this report. However, strategies B, C, D, E will be described as they appear in the MTFEP and subsequently evaluated.

Relief Measure B. "More Missouri Per Gallon" Public Information Program:

"Missourians use more than three billion gallons of motor fuel a year. A large amount of this fuel can be saved through the use of more fuel-efficient vehicles with proper tuning, improved driving habits, and by planning trips for maximum efficiency..."More Missouri Per Gallon" is designed to educate residents on how to reduce motor fuel usage without severly disrupting lifestyles and to offer encouragement and incentives

for following the suggestions."..."The program consists of radio and television spot announcements, pamphlets, billboards and newspaper ads...During a Phase II shortage the goal for each driver would be a ten percent reduction in the number of weekly trips; or a ten percent reduction in the number of miles driven weekly; or to join a carpool; or to take mass transit to work or for errands. In a Phase III shortage the goal would be a fifteen percent reduction of total gasoline usage; or a fifteen percent reduction in the number of weekly trips; or a fifteen percent reduction in the number of miles driven weekly; or to join a carpool; or to take mass transit to work or for errands. If voluntary measures are not effective enough and the shortage worsens to Phase IV, mandatory measures will be used in addition to public information as a means of reducing energy consumption."

Campaigns will be launched to acknowledge energy conserving individuals and communities. Materials will be designed to reach teenagers, commuters, pleasure drivers, senior citizens, and school children who have some influence on parental habits. Key words in the campaign will be efficiency, economy, convenience, and energy management. Organizations such as the Division of Tourism and the Missouri Auto Club will become involved in the distribution of booklets. All possible media channels will be utilized including television, radio, newspapers, magazines, organizational publications, billboards, bumper stickers, payroll and billing insertions, and others. Residents will be urged to spend their vacations in Missouri, to plan shorter trips, and to remain in one place longer. In general the public will be shown how to get along by driving fewer miles and how to get the most efficiency from the miles that are driven."

"The procedure below should be followed in implementing all or part of the plan:

1) The Governor will issue an executive order stating his authority and the measures to be taken;

2) A press release will be made from the Governor's office announcing the program and a subsequent public education campaign will be initiated;

3) The Department of Natural Resources - Division of Energy will distribute public service announcements to all radio and television stations in Missouri and will provide newspapers with advertisements;

4) All other media channels will be used to disseminate energy-saving information to the public and to encourage voluntary compliance with the use-reduction goals. This will include cooperation with other state agencies and related organizations; and,

5) The Department of Natural Resources will publicize a hotline number so that questions can be answered and will evaluate the effectiveness of the program."

"The "More Missouri Per Gallon" public information campaign is a voluntary program and therefore enforcement and compliance procedures are not needed."

Relief Measure C. "Ridesharing Program"

"The purpose of this program is to encourage people to travel to work and make other trips using more energy efficient modes, and to provide residents of the state with the tools to initiate the Program. To date, convincing people that the economic benefits of belonging to a carpool or vanpool outweigh the convenience, independence, and comfort of private vehicles presents the major obstacle in implementing effective ridesharing programs. In the event of a severe shortage of transportation fuels, the public will be looking to the government for assistance in finding alternative modes of transportation. This program is designed to encourage residents of Missouri to voluntarily adopt ridesharing measures."

The specific measures to be taken for Ridesharing are:

1. "The Governor of Missouri will contact the Governors of Illinois and Kansas to solicit their support in encouraging public participation in carpool/vanpool programs already in operation in the St. Louis and Kansas City metropolitan areas."
2. "Through local chambers of commerce and councils of government, the Governor will also direct ridesharing programs throughout the state using the program presently available from the Department of Natural Resources - Division of Energy. A carpool/vanpool matching system will be made available in addition to assistance on how to develop a carpool or vanpool."
3. "The state of Missouri will set an example for other employers and employees by implementing and promoting a strong ridesharing program for state employees. The system to achieve this goal is already in place. The Governor will encourage local governments, employers, and commercial garages to provide preferential parking for carpool/vanpool vehicles. DNR-DE will provide assistance in developing such a program. Local governments should pass ordinances which provide incentives such as increased availability or lower price to ridesharing participants for parking in municipal facilities. The Division of Tourism will encourage the adoption of special rates for parking and admission to amusement parks, sporting events and other similar activities based on vehicle occupancy. Vanpools with their own fuel storage facilities have the same high priority as mass transit in the state petroleum set-aside program. These regulations may be changed to give all vanpools a high priority."

The procedures for implementing ridesharing include the following:

1) "The Governor will issue an executive order stating his authority and the measures to be taken;

2) A press release will be made from the Governor's office announcing the program and a subsequent public education campaign will be initiated;

3) Upon request, the Missouri Division of Energy will assist local governments and private companies in initiating ridesharing programs by providing computer software and information on manual matching. A self-help ridesharing manual is currently being developed for this purpose. During more severe shortages DNR-DE may solicit local government participation in these programs; and

4) The Department of Natural Resources will initiate a public information campaign, will publicize a hotline number so that questions can be answered, and will evaluate the effectiveness of the program."

"The ridesharing program is a voluntary one and therefore enforcement and compliance procedures in general are not needed. The exceptions would be the state set-aside priorities and preferential parking regulations. The federal government enforces the set-aside program and local governments, through their own ordinances, will provide for compliance with any preferential parking programs."

Relief Measure D "Driver Energy Conservation Awareness Training Program:

"A significant amount of transportation fuel can be saved without reducing the number of miles driven but rather by driving and maintaining vehicles more efficiently. The Driver Energy Conservation Awareness Training Program (DECAT) has been tested by the Department of Energy in several locations with the results showing impressive improvements in fuel economy as well as enhanced driving safety. The Driver Energy Conservation Awareness Training Program (DECAT) will be conducted in Missouri utilizing the U.S. Department of Energy's established program. A series of at least twenty 2½-day seminars, including a laboratory phase, will be presented at the Missouri Highway Safety Instructional Park on the campus of Central Missouri State University. The audience to be targeted will be high school Drivers' Education teachers and other driver training instructors for various governmental agencies and schools. In addition, similar workshops will be held for driving instructors and operators of fleets. By concentrating on the training of instructors, these people can return to their agencies, schools or communities and start their own Energy Conservation Education programs. It is expected that even trained people will not always drive to achieve the best possible fuel economy. However, in an energy emergency the public will be more inclined toward driving as efficiently as they know how and this program will provide a pool of trained instructors and drivers that can be tapped in a fuel shortage."

The procedures for implementing the DECAT Program are:

1) "The Missouri Safety Center will design the instructor program, develop the series of seminars, and obtain the vehicles and other equipment;

2) The instructor training courses will be conducted and data will be compiled in order to evaluate the effectiveness of the program;

3) In the event of a transportation fuel shortage, a news release will be made from the Governor's office explaining the situation and calling for maximum driving efficiency by the public. Persons who have participated in the DECAT program will be asked to help inform Missouri's citizens of driving techniques to obtain the highest possible fuel economy; and

4) The Department of Natural Resources will initiate a public information campaign, will publicize a hotline number so that questions can be answered, and will evaluate the effectiveness of the program."

"This measure in itself will be strictly voluntary. Participants will attend the seminars on a voluntary basis and will follow their own judgment in using the more fuel-efficient driving techniques. However, the training provided by this program could be used to help meet mandatory reduction targets for state and local governments and fleet operations."

Relief Measure E: "Reduced Transportation Fuels Consumption by Local Government:"

"Local governments not only consume a large amount of energy, but they also have considerable influence over the residents in their areas as to how they consume fuel. During an energy shortage, local governments must take the lead in reducing their own energy consumption and develop programs to encourage the reduction of energy usage by all individuals and residents in their areas."

The targets for fuel use reduction by local governments would be the same as for State government departments, namely:

1) "In a Phase II or mild shortage the local governments should reduce their gasoline and/or diesel fuel consumption by 10 percent when compared with the same month in the base year of 1978.

2) During a Phase III or moderate shortage the goal for local governments will be a 15 percent reduction in fuel consumption without curtailing any essential or critical services.

3) In a Phase IV or severe shortage local governments should reduce fuel consumption by 25 percent and should give essential and critical services the highest priority."

"There are many things that local governments can do to reach their goals. Among them are:

- develop programs for flexible working hours or compressed work week for local government employees;
- wherever feasible, allow employees to do their work at home one or two days per week;
- creation of a two-way communication system between the local governments and the Division of Energy and coordinated through the Regional Planning Commission so that DNR-DE can stay informed of the local situation and can relay pertinent information back to the local areas."

"The local governments will not be required to submit their plans for approval. However, for assistance in developing contingency plans, they should contact the Department of Natural Resources - Division of Energy. Any planning that is done prior to an energy emergency will help local governments and their citizens cope with a fuel shortage."

"The role of local governments in energy emergency management is not limited to municipal operations. When members of a community begin to experience the symptoms of rising energy costs and reduced supplies, the local government unit is often the first place they go for antidotes. Therefore, local governments should plan to take steps to encourage the public to save energy and offer alternative transportation methods. Actions that many cities may take include:

- working with major employers to develop staggered or flexible working hour programs or compressed workweeks. Standby plans could be drawn up for each major employment site and then put into effect on an as-needed basis during an emergency. Flexible hours will assist transit systems in handling anticipated increases in ridership during peak periods and will also reduce congestion in the transportation system for automobile drivers;
- contacting the Division of Energy to obtain assistance in developing carpool and vanpool matching programs for all residents;
- establishing preferential parking privileges including increased availability and lower prices for ridesharing participants;
- initiate carpool/vanpool matching programs for municipal employees and establish preferential parking previleges for ridesharing participants;
- reroute or modify the schedules for snow and trash removal, school buses, etc. to be more energy efficient;
- delay or modify road maintenance and repair until the crisis has passed;
- keep all city vehicles tuned and operating efficiently and consider fuel economy when replacing or purchasing new equipment; and
- educate employees in how to drive more efficiently, both on and off the job."

"In addition each local government unit should prepare contingency plans for measures that can be used in an energy emergency. In developing these plans, local governments should identify potential problem areas and explore the steps that can be taken to lessen the burden placed on victims of the fuel shortage. Among the actions that local governments should consider are:

- identification and prioritization of non-essential, essential and critical services performed;
- estimation of the amount of energy consumed by each service and recordkeeping for historical consumption;
- methods for delivering the services in a modified manner in order to be more fuel efficient;
- procedures for obtaining additional fuel supplies from distributors or from the state fuel allocation office;
- purchasing or leasing auxiliary storage facilities to keep at least a month's supply of fuel on reserve for essential and critical services only; and
- conducting workshops or other public information programs to educate persons in how to operate vehicles more efficiently including maintanence, driving to achieve the best possible fuel economy, planning ahead to consolidate shopping trips and other errands, and how to save gasoline while vacationing by using alternate modes of transportation and carefully planning routes and stopovers;
- encouraging bicycling with bikeway facilities such as storage racks and bicycle paths;
- reducing congestion on city streets by restricting on-street parking to off-peak periods, limiting truck delivery hours to off-peak periods, removing unnecessary stop signs and lights from network, modifying continuously functioning lighting to night flashing mode, imposing restrictions on hours and location of travel, and establishing disincentives for single-occupant automobile usage including special lanes for ridesharing or mass transit modes of transportation only;
- using local police forces to more strictly enforce the 55 mph speed limit or a reduced limit if it is put into effect;
- encouraging bus riding or carpooling to school by students, faculty and staff and if necessary directing schools to severly restrict the use of cars by students when a school bus is available for their use;
- limiting extensive idling of vehicles such as buses, taxis and trucks;
- assisting local transit systems in expanding their services through para-transit and jitney services. These services may require amended local ordinances to allow for their operation. Local governments considering this option should request an opinion by the Public Service Commission prior to an emergency situation to ensure that the plan can

be put into operation immediately when needed; and,

initiating other energy conservation programs for the public to encourage reduced fuel usage.

This is by no means meant to be an all-inclusive list of the options available to local governments to help reduce energy consumption. Each municipality and rural area should consider whichever mearsures are feasible and concentrate their efforts where they will be most productive."

The procedures for implementing reduced fuel consumption programs for local government units are:

1) "The Governor will issue an executive order stating his authority and the measures to be taken;

2) A press release will be made from the Governor's office announcing the program and a subsequent public education campaign will be initiated;

3) Upon request the Department of Natural Resources - Division of Energy will assist local governments in developing contingency plans and in implementing use-reduction measures; and

4) The Department of Natural Resources will publicize a hotline number so that questions can be answered and will evaluate the effectiveness of the program."

"The local government program is a voluntary one, therefore no enforcement or compliance procedures are needed. Under a declared emergency, the Governor would direct the local governments to initiate those measures which are within their capabilities. Local governments would enforce the measures they implemented individually."

Relief Measure K: "Truck and Automobile Fleet Energy Management":

"The inability to readily obtain fuel and the rapidly rising cost of fuel cuts into the profit margin of the truck and bus industry and other businesses dependent on the use of motor vehicles. The problem is especially severe in Missouri since the state is the crossroad of the nation's highway transportation system. Fleets of cars, trucks and buses are becoming a bigger and bigger expense for both private industry and government. During a crisis these groups need assistance in obtaining fuel supplies as well as in developing programs for more efficient use of their vehicles."

"Any private firm or government agency (excluding state government agencies which will be subject to a separate measure) having a fleet of ten or more cars, trucks or buses used on the state highways shall develop a contingency plan to reduce the usage of transportation fuels in those vehicles in the event of a Phase III shortage. Reduction levels should be at least five percent in Phase III and ten percent in Phase IV. This measure may be

implemented on a voluntary basis prior to a Phase III shortage in conjunction with the Driver Energy Conservation Awareness Training program. Reduction levels will be based on consumption in the same month of the previous year controlling for any growth in production and/or services. Contingency plans should reflect more efficient use of vehicles rather than a reduction in services. All plans should be submitted to the Department of Natural Resources - Division of Energy as verification of compliance."

"The Department of Natural Resources will assist companies in developing reduction plans, and will provide information on the more efficient use of trucks and automobiles. Information from the U.S. Department of Energy's Truck and Bus Program will be widely distributed in an effort to keep truck and bus operators informed of ways to drive more efficiently. The Department of Natural Resources, in cooperation with the Division of Tourism, will also collect information on the availability of fuel in Missouri and will distribute this information through the use of a toll-free hotline number. Assistance in this endeavor will be requested from local and state officials and organizations related to the retailing of transportation fuels.

"Guidelines for exemptions and issuance of exemptions will be made by the Governor with the advice and assistance of the Director of the Department of Natural Resources. Exemptions under the fleet contingency plan program will be made for those firms whose actions by complying would cause major economic hardships to the firm or reduce essential services to the general public."

The procedures for implementing the fleet energy management program are:

1) The governor will issue an executive order stating his authority, the measures to be taken and the exemptions and exclusions;

2) A press release will be made from the Governor's office announcing the program and a subsequent public education campaign will be initiated;

3) Private firms and government agencies with fleets of ten or more vehicles will prepare use-reduction plans to meet the appropriate level according to the supply shortfall. The plans will be submitted to the Department of Natural Resources;

4) The Department of Revenue - Motor Vehicle Bureau will use their computer files to prepare a list for the Department of Natural Resources of all companies and agencies with ten or more registered vehicles. The list will be used to determine if all eligible groups have submitted plans and to make estimates of potential fuel savings;

5) The firms and agencies will implement their use-reduction plans and will make available for audit any documentation verifying the amount of fuel saved by the use of such plan;

6) The Governor will determine the exemption guidelines and DNR will establish the processing and enforcement procedures;

7) The Department of Natural Resources, or other enforcement officers so designated by DNR, will periodically make selective audits of groups chosen randomly to determine if they are in compliance with the measure; and,

8) The Department of Natural Resources will continue to keep the public informed, will publicize a hotline number so that questions can be answered and will evaluate the effectiveness of the program.

The Department of Natural Resources will use the Motor Vehicle Bureau list of affected groups to check off those that have complied by submitting use-reduction plans. Those not in compliance will be subject to penalty. The Department of Natural Resources will also check to make sure these companies and agencies have saved the required amount of fuel. This will be accomplished through audits of randomly selected firms' documentation of decreased fuel purchases, etc. The audits will be performed by DNR personnel or other enforcement officers designated by DNR to make the audits. Non-compliance will be referred to the appropriate prosecuting attorney. The Governor will determine the policy for exemptions and the Director of the Department of Natural Resources will issue them accordingly.

Relief Measure L: "Mandatory Sticker Plan:"

"The primary goal behind the mandatory sticker plan is to reduce gasoline consumption. By allowing a person to choose a sticker day, the plan preserves the individual's right to pursue the activities that he/she feels are most important and that require access to a car. Each household* can select an optimum day to fit their own needs rather than face a government imposed choice such as would occur under mandatory weekend gas station closings. Under this program, gas lines would be shortened, and a significant decrease in the number of commuting vehicles would ease traffic congestion. A non-removable paper sticker, similar in size to a vehicle inspection sticker, would be affixed to the lower left corner of the front windshield (above the state inspection sticker) of every vehicle registered in the state. The sticker would designate, by color and by printing, the day of the week in which that vehicle would not be permitted on the road. The following color system would be used so that it would be quickly determined what day each vehicle is not to be used."

Sunday:	Yellow	Thursday:	Orange
Monday:	Blue	Friday:	Green
Tuesday:	Purple	Saturday:	Red
Wednesday:	Brown	Exempted:	White

"Each vehicle-owning household would submit an application form to the local state Motor Vehicle Bureau field office requesting a sticker for each vehicle in the household. The vehicle owner(s) would be permitted to choose which day of the week they would prefer to forego driving, but members of

the same household would be required to select the same sticker day for all of their vehicles."

Specific criteria for exemption eligibility and guidelines for exemption processing will be made by the Governor with the advice and assistance of the Director of the Department of Natural Resources. A vehicle may be used on any day in a legitimate emergency which will be defined to the extent possible by the Director of the Department of Natural Resources. However, in many cases it may be necessary for the enforcement authorities to use their own judgement in determining what is a valid emergency. When a driver stopped by enforcement officers claims an emergency, the officer should take down the license number and permit the vehicle to proceed. Spot checks would be conducted after the fact in questionable cases to insure that an emergency situation had actually existed. False claims will result in severe penalties.

"The following vehicles would automatically be exempted and would not display a sticker since they are easily recognized:

- police, fire, ambulance or other emergency vehicles;
- utility emergency or other essential service vehicles;
- vehicles with "disabled" license plates;
- farm machinery not normally used on the highway;
- trucks with commercial plates licensed at 18,000 pounds and above;
- self propelled construction equipment which is not designed for the transportation of persons or property on the highways;
- motorcycles and mopeds;
- tractors, tractor-trailer combinations or truck-trailer combinations;
- passenger transportation services including buses and taxis that are licensed and clearly marked; and
- out-of-state vehicles which will be exempt under a state implemented plan only.

In addition, the Governor through the Director of the Department of Natural Resources may establish guidelines to exclude from participation in the mandatory sticker program any person or class in which participation would:

- result in a severe, immediate and continuing danger to the health, safety or welfare of one or more persons; or
- render impossible the actual performance of any trade, occupation or profession by such person or class.

The following applicants may qualify for exclusion under this section:

- vehicles used for essential services which are not immediately recognizable as such including doctors and other medical services, fire

fighters, etc.;

- motor vehicles which are rented for less than two weeks;
- passenger transportation services including registered vanpools, etc.;
- traveling salespeople;
- manufacturer's representatives;
- physically handicapped or disabled persons; and
- operators of vehicles with commercial plates which are licensed at less than 18,000 pounds and are used exclusively to conduct business seven days each week."

"Persons living in rural or isolated areas without access to alternative means of transportation will be given special consideration if applying for exemption under this section. Additional information and application forms for the above exemptions will be available upon request through the Department of Natural Resources and the Motor Vehicle Bureau field offices."

The procedures necessary for implementing the mandatory sticker plan are:

1) "The Governor will issue an executive order stating his authority, the measures to be taken, the exemptions and exclusions, and the date on which the program becomes mandatory and all vehicles must display a sticker;

2) A press release will be made from the Governor's office announcing the program and a subsequent public education campaign will be initiated;

3) The Department of Revenue - Motor Vehicle Bureau will use their computer files to print forms for choosing sticker days. Owners of one or more registered vehicle(s) will receive one card with all of their vehicles listed by year, make and serial number. If more than one owner of vehicles resides at the same household all vehicles of that household must have the same sticker day. All vehicles owned by members of the same household will display stickers for the same day.

4) The cards and instructions for completing the applications will be be mailed to each vehicle owner;

5) After receiving the application forms, the vehicle owners will confer with other members of the household and select one day of the week on which no cars in the household will be driven. The vehicle owner will take the completed application form to the local Department of Revenue - Motor Vehicle Bureau field office for processing and sticker issuance. Vehicle owners who did not receive a card in the mail will be able to apply for one at the field office, however, they will not be issued a sticker until a check has been made to insure that multiple stickers have not been issued;

6) Forms for applying for an exemption will be distributed upon request through the local Motor Vehicle Bureau field office. The completed form along with the necessary supporting evidence for the vehicle(s) will be presented to the local Motor Vehicle Bureau field office for examination and processing....Additional vehicles belonging to the applicant but not used exclusively for exempted purposes will be issued a colored sticker in the normal manner;

7) Colored vehicle stickers (and white exemption stickers) will be issued to the vehicle owners from the Motor Vehicle Bureau field offices. Each sticker will be numbered and the year, make, and serial number of the vehicle will be written on the back.

8) The local Motor Vehicle Bureau field offices may wish to set up procedures for limiting the number of persons waiting in line each day to receive their stickers. They may also wish to have certain days or times set aside for the issuance of exemption stickers.

9) Temporary stickers will be available at the local motor vehicle offices for use on newly purchased vehicles.

10) All stickers must be in place within the specified time set by the Governor. On that date enforcement will begin and vehicles on the road without a sticker or being used on the sticker day will be subject to penalty.

11) State Highway Patrol, county sheriffs departments and local police forces will enforce the program;

12) After the program is in place, persons wanting to change their sticker day may apply to the local Motor Vehicle Bureau field office.

13) The Department of Natural Resources will continue to keep the public informed, and will publicize a hotline number so that questions can be answered and will evaluate the effectiveness of the program; and

14) Because of the great expenditures of time and money needed to implement this plan for just a one-time use, it would be more efficient to continue issuing stickers after the emergency has ended. Vehicle owners would renew their stickers at the same time they get new license plates. In that way, if another severe energy shortage arises and an emergency use-reduction measure is needed, a working plan will already be in place. Initial start-up costs and lead time will be greatly reduced and the public will be prepared quickly."

"Enforcement of the plan will be accomplished primarily in the course of routine state and local police activities and by the local prosecuting attorney. Enforcement offices will be given notification of the program when it is initiated. They will be provided with information on exemptions and

enforcement policies, including copies of forms and procedures in obtaining exemptions.

Although details are not presented for all the strategies contained in the MTFEP, it is clear that the document does suggest some rather complicated programs which would have some cost to implement. These cost have been estimated by the Missouri Department of Natural Resources and they are summarized along with the potential fuel use reduction capability in Table 20.

University of Missouri 1977 Rural Resident Survey (26):

The Office of Rural Development at the University of Missouri-Columbia conducted a survey of 3,391 rural open-country families between August and November, 1977. Their survey focused on Crawford, Dent, Gasconade, Maries, and Washington Counties in the Meramec Region. It was found that the average open-country rural family owned two vehicles and drove to town an average of two times per week in addition to work trips.

Data were also gathered with respect to distances traveled to work, activities and basic services in the Meramec area and these are summarized in Table 21. It is quite interesting that these average trip lengths are considerably higher than the average trip lengths reported from non-SMSA residents as determined from the 1977 Nationwide Personal Transportation Study (NPTS). The NPTS cited average work trip lengths on the order of 10.6 to 11.8 miles for residents in areas of less than 5,000 population. However, in the Missouri survey open-country residents travel between 26 and 29 miles to their place of work. It is believed that this statistic is somewhat influenced by those rural residents who travel very long distances (e.g. 50 to 100 miles) to their place of employment in a larger urbanized area such as St. Louis.

Another aspect of this rural family survey was concerned with the acceptability of different energy conservation measures if the price of energy continued to increase. The results of this question are shown in Table 22. As might be expected, relatively few people were willing to change their location of residence, while as many as 49% would drive less, 36% would purchase a smaller vehicle and 36% were willing to carpool.

Small Community and Rural Resident Attitude Surveys:

Several small community (and surrounding rural area) surveys have been performed in Missouri since 1976 by the University of Missouri County Extension Offices in cooperation with the Office of Rural Development and the various regional planning commissions. Almost all of these surveys contained questions about travel patterns, transportation needs and energy conservation. The results of all these surveys have been reviewed for possible inclusion in this study. Selected questions and replies from the surveys performed in Belle, Kennett, Newburg and Doolittle, Ava, Salem, Potosi, Rolla, West Plains, and Steelville are summariezed below:

TABLE 20. ESTIMATES OF THE COSTS AND EFFECTIVENESS FOR FUEL CONSERVATION MEASURES PROPOSED IN THE MISSOURI TRANSPORTATION FUELS EMERGENCY PLAN

PROGRAM MEASURE	PERCENT REDUCTION IN TOTAL DAILY GASOLINE AND/OR DIESEL CONSUMPTION[1]	COST TO IMPLEMENT FOR FIRST YEAR[2]
1) Reduced Transportation Fuels Consumption by State Government	.04% to .11%	$ 1,000
2) "More Missouri Per Gallon" Public Information Campaign	.67% to 1.9%	$ 16,500
3) Ridesharing Program	2.7% to 3.7%	$ 12,000
4) Driver Energy Conservation Awareness Training Program	.17% to .40%	$ 59,750
5) Reduced Transportation Fuels Consumption by Local Governments	.08% to .21%	$ 20,000
6) Minimum Purchase and Flag Program	less than .1%	$ 7,600
7) Odd/Even Purchase and Flag Program	less than .1%	$ 10,100
8) Daily Sales Limits and Staggered Operating Periods	less than .1%	$ 7,200
9) Liberalization of State Regulations on Truck Weights	.7% to .9%	$ 5,200
10) Vehicle Speed Limitations[3]	.8% to 3.1%	$ 2,648,300
11) Truck and Automobile Fleet Energy Management Program	.17% to .35%	$ 21,000
12) Mandatory Sticker Plan	4.3% to 8.6%	$ 2,555,000

1. The individual fuel-use reductions should not be totaled because of fuel savings overlap among some of the measures.
2. These include the estimated costs to the State of Missouri only.
3. These figures represent the highest maximum cost per gallon possible since the expenses are those that would be necessary to strictly enforce the 50 MPH speed limit.

TABLE 21. DISTANCES TRAVELED ONE-WAY FOR OPEN-COUNTRY RURAL RESIDENTS IN THE MERAMEC REGION

Trip Purpose	Average One-Way Travel Distance in Miles
Work, head of household	29
Work, spouse	26
Grocery Shopping	11
Banking	11
Recreation	11
School	8
Religious Services	6
General Medical Care	22
Specialized Medical Care	54

Source: "Rural Residents: Life Styles in the Ozarks," Rural Development Office, University of Missouri-Columbia, 1979.

TABLE 22. WILLINGNESS OF OPEN-COUNTRY RURAL RESIDENTS TO ADOPT ENERGY CONSERVATION PRACTICES

Energy Conservation Practice	Percent of Families Willing to Adopt
Move Closer to Town	10%
Buy Smaller Vehicle	36%
Drive Less	49%
Car Pool	36%
Solar Energy	25%
Burn More Wood	73%
Winterize House	63%
Lower Heat	65%

Source: "Rural Residents: Life Styles in the Ozarks," Rural Development Office, University of Missouri-Columbia, 1979.

Survey Question: "Would you like to have the community help organize car pools?"

Replies:

	Community			
	Belle	Kennett	Newburg & Doolittle	Total
Yes	154	383	143	680
No	69	134	51	254
No Answer	394	373	158	925
Total	617	890	352	1,859

Survey Question: "If a car pool service were available, would you use the service?"

Replies:

	Community			
	Belle	Kennett	Newburg & Doolittle	Total
Yes	111	243	87	441
No	63	161	59	283
No Answer	443	486	206	1,135
Total	617	890	352	1,859

Survey Question: "Would you use a commuter parking lot, if available?"

Replies:

	Community		
	Ava	Salem	Total
Yes	143	415	558
No	313	778	1,091
No Answer	139	679	818
Total	595	1,872	2,467

Survey Question: "Which of the following facilities do you think are needed in the community?"

Replies to "Bicycle facilities":

	Community				
	Belle	Potosi	Rolla	West Plains	Total
Yes	247	380	3,668	1,094	5,389
No	136	114	1,144	539	1,933
No Answer	234	192	1,043	607	2,076
Total	617	686	5,855	2,240	9,398

Survey Question: "Do you feel the following community service is adequate?"

Replies to "Sidewalks":

	Community						
	Ava	Belle	Newburg & Doolittle	Potosi	Rolla	Salem	Total
Yes	173	316	59	342	2,413	425	3,682
No	348	265	222	244	2,632	1,180	4,891
No Answer	74	136	71	100	810	267	1,458
Total	595	617	352	686	5,855	1,872	9,977

Survey Question: "When do you usually buy the following?"

Replies to "Groceries":

	Community						
	Ava	Belle	Newburg & Doolittle	Potosi	Rolla	Salem	Total
In Town	489	436	90	592	5,191	1,473	8,271
Outside this Town	68	84	184	37	207	228	806
No Answer or Never Buy	38	97	78	57	457	171	898
Total	595	617	352	686	5,855	1,872	9,975

Survey Question: "Would you use public transportation to other Missouri towns and cities?"

Replies:

	Community		
	Salem	Steelville	Total
Yes	493	84	577
No	738	154	892
No Answer	641	113	754
Total	1,872	351	2,223

Several important conclusions can be drawn from the results of these community attitude surveys. It is quite apparent that in those communities surveyed the residents were highly in favor of their city becoming involved and assisting in a local car pooling effort.

Furthermore, of those responding to the question concerning use of the car pool service, a total of 441 persons said they would utilize the service, and 283 said they would not. This represents a very high level of interest on the part of those community residents who had an opinion on the question of car pool use.

A significant number of individuals also expressed an interest in having a commuter parking lot available in their community. Approximately 34% of those replying were in favor of such a facility in the Ava and Salem surveys. Actually, this should be considered as a highly positive display of interest in a commuter lot because there would be a rather large number of the community residents that would not have a need for this type of parking lot since they traveled out of town very seldom. It would seem that even if only 50% of those indicating an interest in using a commuter parking lot would indeed use the lot if available, it would still be justified to construct the facility.

There was substantial interest in both bicycle facilities and sidewalks in most of the communities surveyed. An overwhelming majority consistently favored bicycle path development for their community. Residents appeared to be somewhat dissatisfied with the condition or extent of sidewalks in their community. Residents of the smaller communities such as Ava (population 2,757), Newburg and Doolittle (combined population 1,456), and Salem (population 4,470) were especially concerned about their sidewalks.

Questions asked regarding the location of purchases (i.e., in town or travel to another town) are indicative of the desire and perhaps necessity for making certain types of trips. For example, the question on purchase of groceries revealed that in most cases fewer than 10% of individuals replying bought their groceries out of town. However, in a small community area such as Newburg and Doolittle approximately 67% of those replying purchased their groceries in another town.

The question regarding the use of public transportation for travel to other Missouri towns and cities was answered favorably by only 39% of those replying. However, this is a situation where many people would ordinarily not have a need for public transportation due to their rather infrequent travel between towns. If there were a public transportation service to Salem and to Steelville, and if 39% of the community residents would actually use the service, it would be an unbelievable success.

Meramec Regional Public Transit Plan:

In 1980-81 the Meramec Regional Planning Commission (MRPC) conducted a public transportation study of the six-county region. Supported by U.S. Dept. of Transportation Section 18 (27) funds, this study documented existing transportation services as well as the unmet demands for public transportation in the region. An inventory of transportation providers was performed as a part of this MRPC project. The only substantial public transportation service in the region was found to be on I-44, served by Missouri Transit, Greyhound, and Trailways. Missouri Transit also has two round trips daily between Rolla and Jefferson City. V-K Bus Lines has two round trips per week between Vienna and St. Louis. M & M Transit based in Owensville carries riders from Owensville, Rosebud and other cities along Highway 50 to several large employer sites in the St. Louis area. Eagleclaw Transit based in Cuba carries commuting workers to a large construction project in Callaway County, Missouri. The inventory revealed 341 school buses in the six-county region, of which 15 were available for multi-purpose use. Vandalia Bus Line connects Potosi with St. Louis. Nine taxi cab companies were found to be operating in the Meramec Region, with four of these being in Salem and two in Rolla. Two elderly and handicapped transportation providers operate in the region. The Southeast Missouri Transportation Service has four counties and OATS Inc., has two of the counties. These providers typically have one van per county. But they also provide a regularly scheduled long-distance medical service using vans that are rotated in location. One of the surveys conducted by MRPC was concerned with employees of large (workforce greater than 25) firms, with 830 responses being received. These employees highly favored public transportation system development in the region, with 71% of those from Phelps County stating they would use it if available, and 62% of the employees from other counties responding positively. The use of a carpool-vanpool locator service was also highly favored by these employees, with 57% of those replying stating they would utilize such a service. Unfortunately, there is no employer organized carpool system operating in the six county region.

City of Rolla Public Transportation Study:

Rolla is the only community in the six-county Meramec Region to have conducted a public transportation study (28) as a result of the Section 18 Program. Several surveys were conducted during this 1980-81 study, including as intensive study of small businesses in the City and the transportation needs of the employees and managers. Questionnaires were hand-carried to 97 firms and returns were obtained from 93 of these. There was a favorable response to the concept of a local public transportation service, with 56.1% of those responding indicating they would use public

transportation if available. Slightly over 15% indicated they would use public transportation at least six times per week.

When asked if they would use a carpool or vanpool locator, almost 58% stated they would utilize such a service. Employees were also asked about their mode of travel to work, and the results are shown in Table 23. Only 9.6% indicated they were in a carpool or a passenger in a car. Almost 6% walk to work and almost 3% ride a bicycle weather permitting. When all categories of "Driving own car" are combined, almost 78% appear to be driving alone to work. Another survey directed toward the business managers contained a question to determine whether or not the business manager/owner would be willing to contribute to an employees bus rider pass if they would ride a bus to and from work. Approximately 20% of the managers/owners indicated they would be willing to contribute all or part of the cost of an employee bus pass.

Local Government Officials Survey:

In order to obtain as much input to this study as might be possible from officials in a variety of small communities it was decided to develop a mailed out questionnaire concerning transportation energy problems. Items to be included on the questionnaire were developed with the assistance of a city administrator, a public works director and personnel on the MRPC staff. The cover letter for the questionnaire is shown in Appendix A.

The survey was hand carried to all cities in the Meramec Region, and mailed to 31 other communities outside the region (population range 2,900 - 33,000). A survey form was also sent to one nearby military base (Fort Leonard Wood), and to three county courts. Of the 56 surveys sent out, 25 responses were returned. The results of this survey should be viewed as being extremely pertinent to this study since they originate from officials and practicing professionals who are intimately familiar with the transportation problems of rural Missouri. A detailed analysis of the responses and comments was performed, and the results follow:

LOCAL GOVERNMENT OFFICIALS SURVEY
QUESTIONS AND SUMMARIZED RESPONSES

TRAFFIC ENGINEERING QUESTION 1: Who currently provides the traffic engineering expertise for your jurisdiction? (Such as deciding on STOP SIGN or YIELD SIGN installations, designing parking lot access and layout, traffic signal installations, etc.)

City Engineer, Street Dept., Traffic Engineer . . .	18
City Board, City Council	3
Chief of Police, Marshall	6
Missouri Highway Dept.	4
Consulting Engineering Firm	1
Total	32*

*(Note: Some cities provided multiple responses and each was counted separately in the appropriate category.)

TABLE 23. MODE OF TRAVEL TO WORK
FOR SMALL-TO-MEDIUM SIZE
BUSINESS EMPLOYEES IN ROLLA

MODE OF TRAVEL TO WORK	FREQUENCY*	
	CHECKED	% CHECKED
Walk entire distance to work	20	5.8
Ride bicycle to work weather permitting	10	2.9
Drive own car, park on street	28	8.1
Drive own car, park in lot or space provided by employer	164	47.7
Drive own car, park in public lot	76	22.1
Ride and drive in a carpool	7	2.0
Passenger in a car driven by someone else, car parked elsewhere	26	7.6
Use taxi	5	1.5
Other	8	2.3

*five individuals not responding, multiple responses counted.

Source: City of Rolla Public Transportation Study, City of Rolla, June, 1981.

TRAFFIC ENGINEERING QUESTION 2: Are there any locations in your jurisdiction where there is a noticable traffic congestion problem at this time?

	Location of City		
	Inside MRPC*	Outside MRPC	Total
No	8	5	13
Yes	8	4	12
Total	16	9	25

*(Note: Inside MRPC refers to cities located inside one of the six counties in the Meramec Region service area.)

TRAFFIC ENGINEERING QUESTION 3: Do you believe your community is adequately advised with respect to traffic engineering practice and traffic engineering improvements?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	1	0	1
No	5	3	8
Yes	10	6	16
Total	16	9	25

TRAFFIC ENGINEERING QUESTION 4: Have you or any of your staff utilized the booklet entitled "Handbook of Traffic Engineering Practice for Small Cities" distributed by the Missouri State Highway Commission in April 1979?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	1	1	2
No	13	1	14
Yes	2	7	9
Total	16	9	25

TRAFFIC ENGINEERING QUESTION 5: Would you favor having a professional traffic engineer staff member in the regional planning office who would perform traffic engineering and planning services for small cities and counties on a rotating basis?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	3	2	5
No	5	1	6
Yes	8	6	14
Total	16	9	25

TRAFFIC ENGINEERING QUESTION 6: Do you have any comments pertaining to the general subject of traffic engineering and gasoline conservation?

1. "Myself, I think there is more involved than just traffic engineering and gasoline conservation."

2. "I think it is very important in the operations of a city government. For safety, and energy conservation, engineering and public education is essential."

3. "Price too high. We have to conserve."

4. "We need to eliminate some of our 4-way STOPS. We have looked at changing STOPS to YIELD in various locations in the interest of energy savings, but wound up changing to more STOPS due to safety."

5. "They are related directly."

6. "I do not feel that a special effort and cost would be worthwhile above the level of expertise we now enjoy." (Note: From a larger city who uses a consultant as needed.)

TRANSPORTATION FUELS CONTINGENCY PLAN QUESTION 1: Does your community now have a transportation fuels contingency plan outlining actions to be taken in the event of a severe gasoline shortage?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	0	0	0
No	16	8	24
Yes	0	1	1
Total	16	9	25

TRANSPORTATION FUELS CONTINGENCY PLAN QUESTION 2: In the event of a severe gasoline shortage, which level of government do you believe would be most efficient for you to communicate with regarding gasoline conservation programs?

	Location of City		
	Inside MRPC	Outside MRPC	Total
State Energy Office	2	5	7
Regional Planning Commission	11	2	13
County Energy Office	1	0	1
Other	0	1	1
No Reply	2	1	3
Total	16	9	25

CAR POOLING QUESTION 1: Is your community currently involved in a city-wide car pool program?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	0	0	0
No	16	8	24
Yes	0	1	1
Total	16	9	25

CAR POOLING QUESTION 2: Is there any particular group of community residents who might be currently involved in a car pooling or bus riding program?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	0	0	0
No	3	3	6
Yes	13	6	19
Total	16	9	25

CAR POOLING QUESTION 3: In an emergency situation, car pooling could probably be implemented in rural areas and small cities with a manual system of matching riders rather than using a computer. Where in your community might it be possible to establish and operate a car pool coordination center?

City Hall, Court House	14
Community Center	2
Town Square	1
Radio Station	1
Family Services Office	1
Fire Station	1
Senior Citizens Building	1
State Agency	1
Total	22

CAR POOLING QUESTION 4: A helpful device in car pooling might be a reasonably large display board showing a map of the area. People could use this display board to match their trip destinations and desired times of travel. Do you believe this would be a beneficial device in your community if you had a manual car pool coordination system?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	1	1	2
No	4	3	7
Yes	11	5	16
Total	16	9	25

CAR POOLING QUESTION 5: Do you have any comments you would like to make regarding car pooling or any other type of ridesharing program?

1. "It might benefit some but the ones working out of town go different places to work and at different times (going to work or getting off work)."

2. "Ridesharing in general works good when there are several people going to the same place at the same time and they stay there for the same length of time. This is for the most part not the case in small towns where most people work elsewhere."

3. "Yes, have a public meeting and have system explained at this meeting by qualified personnel on this program."

4. "Nevada is too small to have a good car pooling system inside of town. Smaller, near by communities commute into Nevada and maybe car pooling."

5. "I believe a community transportation system would be more efficient (bus)."

6. "I have worked with and participated in such programs in other areas-it might be difficult to 'sell' in this area."

7. "Most civilian employees currently carpool from surrounding communities to Ft. Leonard Wood."

COMMUTER PARKING LOTS QUESTION 1: Does your community currently have a commuter parking lot?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	0	0	0
No	10	6	16
Yes	6	3	9
Total	16	9	25

COMMUTER PARKING LOTS QUESTION 2: Has Your community considered the possibility of building a commuter parking lot? (To be answered only if "No" given to Question 1.)

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	6 (N/A)	3 (N/A)	9
No	8	4	12
Yes	2	2	4
Total	16	9	25

COMMUTER PARKING LOTS QUESTION 3: Do commuters currently use other lots or certain city streets to park on when they meet for car pooling? (To be answered only if "No" given to Question 1.)

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	8 (N/A)	3 (N/A)	11
No	2	5	7
Yes	6	1	7
Total	16	9	25

COMMUTER PARKING LOTS QUESTION 4: Is there commuter parking taking place at other locations in your town in addition to the commuter parking lots? (To be answered only if "Yes" given to Question 1.)

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	8 (N/A)	6 (N/A)	14
No	3	1	4
Yes	5	2	7
Total	16	9	25

COMMUTER PARKING LOTS QUESTION 5: Do you believe additional commuter parking lots should be constructed new for use by residents of your community? (To be answered only if "Yes" given to Question 1.)

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	8 (N/A)	6 (N/A)	15
No	7	1	8
Yes	0	2	2
Total	16	9	25

COMMUTER PARKING LOTS QUESTION 6: In an emergency fuel shortage, rather than wait for new commuter parking to be constructed, would there be existing private or public parking lots that could be used for commuting purposes?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	2	3	5
No	1	2	3
Yes	13	4	17
Total	16	9	25

SIDEWALKS AND WALKING QUESTION 1: Does your community currently have a program of sidewalk network expansion?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	0	0	0
No	14	7	21
Yes	2	2	4
Total	16	9	25

SIDEWALKS AND WALKING QUESTION 2: Does your community have a current inventory of the sidewalk network showing the location and condition of the sidewalks?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	0	0	0
No	16	8	24
Yes	0	1	1
Total	16	1	25

SIDEWALKS AND WALKING QUESTION 3: Please estimate the portion of your developed community served by sidewalks: (check one)

Less than 25% 25%-50% 50%-75% More than 75%

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	1	1	2
0-25%	6	4	10
25%-50%	4	1	5
50%-75%	3	2	5
75%	2	1	3
Total	16	9	25

SIDEWALKS AND WALKING QUESTION 4: Do you believe the general condition of sidewalks in your community might have an adverse influence on the willingness of people to walk to work in the event of a severe gasoline shortage?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	2	1	3
No	13	5	18
Yes	1	3	6
Total	16	9	25

SIDEWALKS AND WALKING QUESTION 5: Do you have any comments you would like to make regarding sidewalks and their possible expanded use in your community?

A. "This is currently under review."
B. "This is a real small city. Half the people don't even use the sidewalks we have (young or old).
C. "There is little need for more sidewalks at this time.
D. "Sidewalks are usually requested and installed by the property owners."
E. "Need more."
F. "More walks would be an asset."
G. "We have expanded the system, particularly along state Highways. Also needs to improve the systems to schools, parks, and shopping areas."

BICYCLE ROUTES AND BICYCLING QUESTION 1: Does your community currently have a program of bicycle route development?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	0	0	0
No	15	8	22
Yes	1	1	2
Total	16	9	24

BICYCLE ROUTES AND BICYCLING QUESTION 2: If many people desired to ride a bicycle to the downtown and/or other activity centers in your town, would the street conditions be adequate to provide them with a safe thoroughfare? (Consider such factors as narrow streets, parked cars, rough street surface, safety at intersections, etc.)

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	0	0	0
No	5	4	9
Yes	11	5	16
Total	16	9	25

Comments given:

1. "People here ride bicycles all the time on the streets for exercise or whatever. There is really not that much traffic."
2. "Most of our streets are wide enough parked cars would not be a problem, street surface condition could be better. Intersections are sufficiently marked."
3. "Yes, each main street has been paved and has adequate shoulder widths for this activity."
4. "Due to narrow streets and parked cars, it would cause some problems."
5. "Good streets. It would be O.K."
6. "Some are-some aren't."
7. "Some individual corridors would be possible, but a total system would be very difficult within existing street patterns."
8. "Yes, but how safe is a 12 lb. bicycle compared to 4,000 lbs. of car?"
9. "Yes, it would be safe enough."
10. "General safety is greatest concern."
11. "50% streets safe enough, but many steep hills."

BICYCLE ROUTES AND BICYCLING QUESTION 3: Do you have any comments you would like to make regarding bicycles and/or bicycle routes and their possible expanded use in your community?

1. "Bicycles could obey traffic laws a little better."
2. "A fair amount of bicycles are presently in use-we have no need for specified bicycle routes."
3. "If necessary, program should be updated and advertised (as available) for general use; bicycle pade with locks could be placed in parking lots."
4. "No bicycles here-just wheel-barrows."
5. "Have very good system."
6. "I don't see any trend increasing locally. It seems to remain fairly constant."
7. "They are dangerous!"
8. "It would create some problems."
9. "Fort Leonard Wood is ideal for bicycles due to the generally low speed limits and numerous troop trails."

PROVISION OF CITY SERVICES: If there were a serious gasoline shortage, some services provided by local government would have to be reduced. Using the list of services given below as a guide, could you identify any modifications to the service or to the pertinent vehicles that may be useful in reducing

fuel consumption. We are especially interested in any changes in services you may have already tried and evaluated:

Note: 52 comments were received.

A. LAW ENFORCEMENT:

1. "This has been reduced. A limit has been on amount of gasoline used per month."
2. "More foot patrol."
3. "Reduce services to only emergency calls and disregard calls having to do with dogs, etc."
4. "Mainly cut here."
5. "Possible cut."
6. "Purchased smaller-more fuel efficient vehicles."
7. "L.P. fuel-more cycles-more walking."
8. "Cut to one patrol car."
9. "Limit random patrol."
10. "Reduction in vehicle size and number of patrols."

B. TRASH COLLECTION:

1. "We would have to evaluate entire trash collection system."
2. "Handled by private enterprise."
3. "This is done by city contract approved collection by a private concern."
4. "Done by private haulers."
5. "Reduce frequency-type of service-bag only."
6. "Reduce frequency of collection."
7. "Change residential collection from twice weekly to once."

C. FIRE PROTECTION:

1. "There should be no change."
2. "Reduce unwarranted driving."

D. STREET MAINTENANCE:

1. "Sectionalized Maintenance; lunch at job site."
2. "Could be almost eliminated in over 50% of our roads-would be cut at least 50%."
3. "Could be reduced."
4. "Evaluate entire street maintenance system."
5. "If they had to, they could."
6. "Cut service."
7. "Purchase diesel vehicles when cost effective."
8. "R/W mowing-removal of unnecessary traffic controls."
9. "Cut number of trucks used and (use more efficient trucks)."
10. "Reduce sweeping."

E. UTILITIES:

1. "Sectionalized maintenance."
2. "Water and sewer are required to maintain a town of any size. Other things can be shorted, but not these two."
3. "50% reduction by city government."
4. "Possible cut."
5. "Went to 4-speed, 6-cyclinder vehicle to get better mileage."
6. "Return to guidelines 5-78."
7. "Meter reading could be done by walking."
8. "Reduce meter reading."

F. ANIMAL CONTROL:

1. "Stopped if necessary."
2. "Using smaller vehicle to get better mileage."
3. "Reduce patroling."
4. "Cut out."
5. "Reduce collection and enforce through fining."

G. PARKS AND RECREATION:

1. "Parks in Rosebud are owned and controlled by the churches." Not a city controlled facility."
2. "Will have to be evaluated."
3. "Reduce mowing."
4. "Cut gas use in half."
5. "Reduce level and frequency of mowing."

H. CITY ADMINISTRATION:

1. "Could cut mileage a little (quit going to M.R.P. meetings)."
2. "50% reduction by city government."
3. "Smaller, more fuel efficient cars have been purchased."
4. "Establish policy for vehicle purchases in regard to energy consumption-general policy for use of A.C."

I. OTHER:

1. "During a severe gasoline shortage current plans call for a 20% reduction in fuel use across the board for all activities as a first measure. Further steps will be taken by the energy conservation board if required."

GENERAL QUESTION ON GASOLINE CONSUMPTION RECORDS: Does your office maintain an active gasoline use monitoring program to keep records on the amount of gasoline consumed?

	Location of City		
	Inside MRPC	Outside MRPC	Total
No Reply	2	0	2
No	6	2	8
Yes	8	7	15
Total	16	9	25

DO YOU HAVE ANY OTHER COMMENTS YOU WOULD LIKE TO MAKE REGARDING GASOLINE USE AND GASOLINE CONSERVATION PROGRAMS IN RURAL AREAS AND SMALL CITIES:

1. "There is a real need for technical assistance for rural areas."

2. "As long as the price of gas stays in the $1.25 and up bracket, you do not have to be overly concerned about conservation programs. Everybody uses the smallest amount they can buy with."

3. "This program could be explained to the general public at a general public meeting. I think it should be as no one knows it exists at this time."

Meramec Region Telephone Interview:

A telephone interview was developed in order to obtain rural and small community residents opinions and recommendations regarding fuel conservation and appropriate actions to be taken in the event of a severe petroleum shortfall. Those individuals called on to participate in the interview were selected at random from the telephone directory using a procedure based on the last digits of the previous number called. Telephone calls to the six counties were made in proportion to the population of the county, with the exception that no calls were placed to residents of Gasconade County. The two major communities (Owensville and Hermann) in Gasconade County were conducting community attitude surveys at the time of the telephone interviews, and these community attitude surveys contained several transportation energy questions which had been included in cooperation with this study.

Appendix B contains the introduction and the interviewing procedure as it was used during the telephone conversation. One hundred seventy-seven interviews were completed, which provided a minimum of 20 interviews for the least populated county in the region. Each interview required between six

and ten minutes to complete, depending on the extend of suggestions and input received from the respondent. The results of each interview were keypunched on computer cards and analyzed using a computer program known as the Statistical Package for the Social Sciences. A detailed listing of the questions and responses follows:

QUESTION 1: Do you feel the government has adequately informed you about the seriousness of the energy supply problems?

	Number of Responses	Percentage Distribution
Not Sure	41	23.2
No	70	39.5
Yes	66	37.3
Total	177	100.0

QUESTION 2: Suppose there was a 50% gasoline shortage; to save gasoline would you be willing to make any of the following changes?

	Yes	No	Already Have	No Reply
1. Would you buy a better gas mileage vehicle?	67	46	59	5
2. Would you maintain your vehicle better?	76	17	77	7
3. Could you bicycle to work?	13	103	1	60
4. Could you walk to work?	15	98	4	60
5. Would you be able to combine grocery shopping with other trips?	87	12	75	3
6. Would you ride a bus to work if one were available?	76	38	1	62
7. Would you convert your vehicle to propane fuel?	53	114	1	9
8. Would you purchase any gas saving device for your vehicle?	101	47	19	10

QUESTION 3: Would you drive slower according to a lower speed limit on a two-lane highway?

	Number of Responses	Percentage Distribution
No Reply	7	4.0
No	60	33.9
Yes	110	62.1
Total	177	100.0

QUESTION 4: Since you said yes that you would drive slower on two-lane highways, how slow a speed limit do you think would be reasonable below the present 55 mph limit?

Speed Limit, MPH	Number of Responses	Percentage Distribution
35	1	0.6
40	17	9.6
45	39	22.0
50	49	27.7
No Reply/N.A.	71	40.1
Total	177	100.0

QUESTION 5: If gasoline is very scarce, do you feel road maintenance should be improved or delayed?

	Number of Responses	Percentage Distribution
No Opinion	24	12.4
Delay	28	15.8
Improve	125	70.6
Total	177	100.0

QUESTION 6: Would it be possible for you to change your work schedule to a four-day work week?

	Number of Responses	Percentage Distribution
No Reply	61	34.4
Not Sure	12	6.8
No	65	36.7
Yes	39	22.0
Total	177	100.0

QUESTION 7: Do you or your spouse share rides with friends or neighbors for non-work trips? (i.e., shopping)

	Number of Responses	Percentage Distribution
No Reply	2	1.1
No	70	39.5
Yes	105	59.3
Total	177	100.0

QUESTION 8: Would you be able to share rides or carpool if there was a 50% gasoline shortage?

	Number of Responses	Percentage Distribution
No Reply	1	1.4
No	18	25.4
Yes	52	73.2
Total	71	100.0

*(Note: answered only by those giving a "No" response to Question 7.)

QUESTION 9: Would the rides you share be for work or non-work trips?

	Number of Responses	Percentage Distribution
No Reply	1	1.9
Work	11	20.4
Non-Work	30	55.6
Both	12	22.2
Total	54	100.0

*(Note: answered only by those giving a "No" response to Question 7.)

QUESTION 10: How many vehicles are available for the people in your home?

Number of Vehicles	Number of Responses	Percentage Distribution
None	5	2.8
One	49	27.7
Two	79	44.6
Three	25	14.1
Four	9	5.1
Five or More	9	5.1
No Reply	1	0.6
Total	177	100.0

QUESTION 11: How many people in your home are wage earners?

Number of Wage Earners	Number of Responses	Percentage Distribution
None	49	27.7
One	70	39.5
Two	39	22.0
Three	12	6.8
Four	6	3.4
No Reply	1	0.6
Total	177	100.0

QUESTION 12: Does the primary wage earner work at home or travel to work?

Place of Work	Number of Responses	Percentage Distribution
Works at Home	15	8.5
Travels to Work	109	61.6
No Reply/N.A.	53	29.9
Total	177	100.0

QUESTION 13: If primary wage earner travels to work, how does he/she travel?

Travel Mode	Number of Responses	Percentage Distribution
Uses Own Car	73	41.2
Car Pool	30	16.9
Walk	5	2.8
Bus	0	0
Bicycle	0	0
Taxi	0	0
No Reply/N.A.	69	39.0
Total	177	100.0

QUESTION 14: If the primary wage earner uses own car or carpools does he/she use this car just to get to work or is it being used for business travel? (for example, as an electrician)

Primary Wage Earner Use of Car	Number of Responses	Percentage Distribution
Just to get to work	70	39.5
For business travel	33	18.6
No Reply/N.A.	74	41.8
Total	177	100.0

QUESTION 15: Except for the primary wage earner, how do the other wage earners travel to work? (Don't ask if only one wage earner.)

	Uses Own Car	Car Pool	Works at Home	Total
Wage Earner #2	32	18	5	55
Wage Earner #3	6	7	1	14
Wage Earner #4	1	2	1	4
Total	39	27	7	73

QUESTION 16: Is there a place on your (spouse's) way to work which could be used as a commuter parking lot? (If necessary, explain a place where you and a friend could meet and park one of the cars, and then drive the rest of the way together.)

	Number of Responses	Percentage Distribution
No Reply/N.A.	70	39.5
No	69	39.0
Already have a place	12	6.8
Yes	26	14.7
Total	177	100.0

QUESTION 17: Where is this place? (Refers to location asked about in Question 16.)

A variety of responses were obtained, including the following:

A. Highway intersections
B. Cafe parking lot
C. Gasoline station
D. Shopping center lot
E. Old school lot
F. Movie theater lot
G. Livestock association barn
H. Church parking lot
I. Space along road
J. On street
K. Car dealer lot
L. Commuter parking lot

QUESTION 18: Where do you work?

Eighteen separate destinations given, with two people traveling to St. Louis, one to Fenton, and three to Jefferson City.

QUESTION 19: How many people meet at this place (where people meet to share rides)?

Number of People Meeting	Number of Responses	Percentage Distribution
1-2	3	1.7
3-4	5	2.8
5-6	3	1.7
21-34	1	0.6
35-50	2	1.1
More than 50	1	0.6
No Reply/N.A.	162	91.5
Total	177	100.0

QUESTION 20: Suppose a plan for saving gasoline required each family to choose one day of the week when they could not drive any of their vehicles. What day of the week would you choose?

Day of Week Chosen Not to Use Vehicles	Number of Responses	Percentage Distribution
Sunday	38	21.5
Monday	38	21.5
Tuesday	7	4.0
Wednesday	17	9.6
Thursday	7	4.0
Friday	7	4.0
Saturday	28	15.8
No Reply	35	19.8
Total	177	100.0

QUESTION 21: How would such a plan affect you and your household?

	Number of Responses	Percentage Distribution
Inconvenient, but worth it to save gas	84	47.5
Cause some hardships	40	22.6
No affect	45	25.4
No reply	8	4.5
Total	177	100.0

QUESTION 22: Do you have any ideas or suggestions for conservation of gasoline during a severe gasoline shortage?

Seventy responses were received. They have been organized in terms of general impact on driving and listed below:

Gasoline Conservation Strategy	Number of Responses
Drive less, no pleasure driving	21
No vacations	3
Trip planning, combine trips	4
Less driving by government agencies	2
Reduce school bus travel	1
Restrict teenager driving, raise driver age	6
Car pool; forced car pooling, share rides	6
Limit number of cars per family	1
Establish bus lines	1
Lower speed limit, obey speed limit	2
Stop racing	1
Reduce sports events at schools	1
Restrict boating	1
Build better mileage cars	5
Better car maintenance	1
Mandatory sticker plan	1
Gas rationing	3
Price limitations	1
One day per week, no gas sold	2
Purchase gas only on alternate days	1
Use alternate fuels	1
Everyone should use less gas	4
Everyone should sacrifice, not just low income families	1
Total	70

QUESTION 23: What is the primary wage earner's occupation?

Occupation	Number of Responses	Percentage Distribution
Agriculture/Forestry	13	7.3
Mineral Extraction	6	3.4
Construction	11	6.2
Manufacturing	24	13.6
Trade	20	11.3
Services	33	18.6
Communications	1	0.6
Finance, Insurance	1	0.6
Transportation/Utilities	10	5.6
Public Administration	1	0.6
No Response/N.A./Retired	57	32.2
Total	177	100.0

QUESTION 24: Sex of interviewee.

	Number of Responses	Percentage Distribution
Male	64	36.2
Female	111	62.7
Not obtained	2	1.2
Total	177	100.0

QUESTION 25: Do you live out of town, in town, or on the edge of town? (Note: edge of town was defined as being within 1/4 mile of city limits.)

Location of Residence	Number of Responses	Percentage Distribution
Out of town	100	56.5
In town	51	28.8
Edge of town	24	13.6
No reply	2	1.1
Total	177	100.0

For primary wage earners it was determined that 73 of 108 used their own car to drive to work, while 30 out of 108 were in a car pool. For other wage earners in the household, the proportion car pooling was considerably higher. For instance of those classified as the second primary wage earner, 18 out of 50 working outside the home were already in a carpool.

When asked if they were aware of a place on their way to work which could be used as a commuter parking lot, 12 out of 107 indicated they knew where such a lot did exist.

The possibility of having to comply with a mandatory sticker plan would cause some inconvenience for about 48% of the respondents, and cause some hardships for about 23% of the respondents. If such a program were to be implemented it appeared that many people would favor Sunday or Monday for forfeiting use of their vehicles.

Many interesting suggestions and comments were received for conserving fuel. Rural and small city residents favored driving less, with no pleasure driving and no vacations which required driving. The question of continuation of sports events, racing, boating, and recreational activities was raised.

The telephone interview revealed that almost 40% of the respondents did not feel adequately informed about the seriousness of our energy supply problems. Another 23% were not sure about this matter. This indicates a truly unfortunate situation exists. Energy is so basic to the functioning of our society that certainly the citizens should be made aware of their situation and the possibility for future emergencies.

When questioned about their willingness to adopt various conservation measures under a very severe shortage situation, respondents were primarily in favor of actions that would increase the fuel economy of their vehicles and to combine trips. Relatively few people indicated they would be able to walk or ride a bicycle, reflecting the influence of the people living outside of the city limits. For those who were not already carpooling, it was found that under a severe gasoline shortage 73.2% would be willing to share rides.

Rural and small city residents favored lowering speed limits on rural two-lane highways, with reasonable support for a speed as low as 45 mph. They also believed that road maintenance should be improved in the event of a fuel shortage, rather than delay maintenance.

Under a severe shortage situation, 22% indicated they would be able to change their work schedule to a 4-day work week.

Owensville Community Attitude Survey:

The town of Owensville (1980 population = 2,241) participated in an areawide community attitude survey in July, 1981, and agreed to include several questions specifically prepared for this transportation fuels contingency planning study. This survey was delivered in quantity to every household within the Owensville city limits and to nearby rural subdivision. Approximately 1,600 adults had an opportunity to complete the survey; 1,490 were returned; and 1,266 were suitable for key punching and computer analysis. The instructions for the Owensville survey and the transportation questions are shown in Appendix C. A summary of the computer analyses of the responses to the questions follows:

Survey Question 1: "Do you feel the following services in Owensville are satisfactory?"
(c.) "Street repair"

Replies:

	Number of Responses	Percentage Distribution
Yes	247	19.5
No	881	69.6
No Answer	138	10.9
Total	1,266	100.0

(i.) "Sidewalks

Replies:

	Number of Responses	Percentage Distribution
Yes	498	39.3
No	565	44.6
No Answer	203	16.0
	1,266	100.0

Survey Question 34: "Do you feel that county roads are adequately maintained."

Replies:

	Number of Responses	Percentage Distribution
Yes	322	25.4
No	681	53.8
No Answer	263	20.8
Total	1,266	100.0

Survey Question 36: "Do you feel adequately informed concerning the impact a severe gasoline shortage would have on small cities and rural areas?

Replies:

	Number of Responses	Percentage Distribution
Yes	427	33.7
No	438	34.6
No Answer	401	31.7
Total	1,266	100.0

Survey Question 37: "Would a local car pool matching service be useful to you now?

Replies:

	Number of Responses	Percentage Distribution
Yes	148	11.7
No	877	69.3
No Answer	241	19.0
Total	1,266	100.0

Survey Question 38: "Would you favor having the City initiate a local public transportation service coordinated with the OATS Van at this time?"

Replies:

	Number of Responses	Percentage Distribution
Yes	421	33.3
No	419	33.1
No Answer	426	33.6
Total	1,266	100.0

Survey Question 39: "Would you use a commuter park-and-ride lot if it were available now?"

Replies:

	Number of Responses	Percentage Distribution
Yes	239	18.9
No	704	55.6
No Answer	323	25.5
Total	1,266	100.0

Survey Question 40: "Suppose there would be a nationwide gasoline shortage and you had to reduce your gasoline use by 50%: (please answer for each one).
(a.) "Could your work schedule be changed to a 4-day work week?"

Replies:

	Number of Responses	Percentage Distribution
Yes	259	20.4
No	477	37.7
No Answer	530	41.9
Total	1,266	100.0

Survey Question 40: (b.) "Could you share rides to work in a carpool?"

Replies:

	Number of Responses	Percentage Distribution
Yes	394	31.1
No	403	31.8
No Answer	469	37.1
Total	1,266	100.0

Survey Question 40: (c.) "Would it be possible for you to walk to work?"

Replies:

	Number of Responses	Percentage Distribution
Yes	348	27.5
No	490	38.7
No Answer	428	33.8
Total	1,266	100.0

Survey Question 40: (d.) "Would it be possible for you to ride a bicycle to work?"

Replies:

	Number of Responses	Percentage Distribution
Yes	321	25.3
No	530	41.9
No Answer	415	32.8
Total	1,266	100.0

Survey Question 40: (e.) "Would you favor restricting students driving cars to high school?"

Replies:

	Number of Responses	Percentage Distribution
Yes	769	60.7
No	184	14.5
No Answer	313	24.7
Total	1,266	100.0

Survey Question 40: (f.) "Would it be useful to you to have a commuter park-and-ride lot available where you could meet other persons to share rides to other towns?"

Replies:

	Number of Responses	Percentage Distribution
Yes	329	26.0
No	504	39.8
No Answer	433	34.2
Total	1,266	100.0

Survey Question 40: (g.) "Could your household voluntarily give up one day each week when none of the vehicles would be driven?"

Replies:

	Number of Responses	Percentage Distribution
Yes	602	47.6
No	316	25.0
No Answer	348	27.4
Total	1,266	100.0

Survey Question 40: (h.) "Would you favor a speed limit on rural 2-lane highways?"

Replies:

	Number of Responses	Percentage Distribution
Yes	451	35.6
No	233	18.4
No Answer	582	46.0
Total	1,266	100.0

Survey Question 40: (h. continued) If yes, what speed limit would be acceptable to you?

	Speed Limit (mph)				
Response	50	45	40	35	30
Yes	378	201	128	54	17
No	86	90	113	112	115

Survey Question 53: "Where do you usually buy each of the following and why?

Replies:

	Item Purchased			
	Groceries	Hardware	Drugs	Clothing
Inside Owensville	1,071	955	975	570
Outside Owensville	31	87	68	433
Never Buy	10	33	32	12
No Answer	154	191	191	251

Survey Question 60: "If you work outside your home, how do you usually travel to work?"

Replies:

	Mode of Travel to Work					
	Drive Alone	Car Pool	Walk	Bicycle	Bus	No Answer
Number	517	130	54	2	13	550
Percentage	40.8	10.3	4.3	0.2	1.0	43.4
Percentage Disregarding No Answer	72.2	18.2	7.5	0.3	1.8	--

Survey Question 61: "Do you commute to work outside the Owensville area? If yes, how many miles do you travel to your place of work?"

Replies:

	Miles Traveled					
	0-5	6-10	11-20	21-30	30+	No Answer
Number	248	79	49	38	87	765
Percentage	19.6	6.2	3.9	3.0	6.9	60.4
Percentage Disregarding No Answer	49.5	15.8	9.8	7.6	17.4	--

The Owensville survey provides one of the best existing data bases for transportation-energy related attitudes in a small community since it comes from a survey which was so comprehensive that every adult in the community had an opportunity to participate. It is interesting that only 11.7% of the residents would consider using a car pool matching service now, but if a severe gasoline shortage were to occur 31.1% would would be interested in sharing rides to work. Similarly 18.9% of the residents would use a commuter park-and-ride lot if it were available now, but if a severe gasoline shortage were to occur 26.0% would find a park-and-ride lot useful. It is also very significant that 27.5% stated they could walk to work during a severe gasoline shortage and 25.3% stated it would be possible to ride a bicycle to work. It is quite likely there is considerable overlap between the groups who could walk and who could ride a bicycle; however even if there were complete duplication in the membership of these groups it is extremely significant that 25% of the residents could either walk or ride a bicycle. If it could be assumed that those who did not respond to the questions about walking or riding a bicycle were those who did not work outside of the home, then those who responded that they could walk or ride a bicycle could constitute as much as 38% of the work force.

With respect to changing work schedules to a 4-day work week, 20.4% of the residents replied this would be possible during a severe gasoline shortage. Again if it could be assumed that those who did not respond to the question were those who did work outside the home, then those who responded they could work a 4-day week could constitute as much as 35% of the work force.

The Owensville residents were found to strongly favor restricting the driving of high school students during a severe shortage. They also believed the speed limit could be decreased on rural two-lane highways, with a reasonably strong showing of support for a limit as low as 40 mph. Surprisingly, 47.6% of the respondents indicated they would be able to give up one day per week when none of their vehicles would be driven.

For those working outside the home, 72% drove alone and 18% were in car pools. Less than 8% walked or rode a bicycle, and only 1.3% rode a bus. 50% of the respondents traveles more than 5 miles to work, and 17.4% traveled 30 or more miles to work. It is interesting that 33 percent of the residents favored initiating a local public transportation service at this time.

Herman Community Attitude Survey:

The town of Hermann (1980 population = 2,685) also participated in an areawide community attitude survey in August, 1981, and agreed to include several questions for the transportation fuels contingency planning study. This survey was delivered to every household within the Hermann City limits, to homes in nearby rural subdivisions and to the communities of Berger, Gasconade, Morrison, Bay, Big Spring and Stony Hill. Approximately 4,450 adults had an opportunity to complete the survey; 1,364 surveys were returned; and 1,124 were suitable for key punching and computer analysis. The instructions for the Hermann survey and the transportation questions are shown in Appendix C. A summary of the responses to the transportation questions follows:

Survey Question 1: "Are you satisfied with the following community services?" (c) "streets"

Replies:

	Number of Responses	Percentage Distribution
Yes	323	28.7
No	626	55.7
No Answer	175	15.6
Total	1,124	100.0

Survey Question 1: (f) "Sidewalks"

Replies:

	Number of Responses	Percentage Distribution
Yes	455	40.5
No	436	38.8
No Answer	233	20.7
Total	1,124	100.0

Survey Question 41: "Where do you usually buy each of the following?"

Replies:

	Item Purchased			
	Groceries	Hardware	Drugs	Clothing
Inside Hermann	729	761	729	260
Outside Hermann	66	187	212	645
Never Buy	5	34	46	14
No Responses	329	142	137	205

Survey Question 47: "Do you feel adequately informed concerning the impact a severe gasoline shortage would have on transportation in small cities and rural areas?"

Replies:

	Number of Responses	Percentage Distribution
Yes	322	28.6
No	264	23.5
No Answer	538	47.9
Total	1,124	100.0

Survey Question 47: "Suppose there would be a nationwide gasoline shortage and use had to reduce use by 50%."
(continued)
(a) "Could your work schedule be changed to a 4-day work week?

Replies:

	Number of Responses	Percentage Distribution
Yes	243	21.6
No	380	33.8
No Answer	501	44.6
Total	1,124	100.0

Survey Question 47:
(continued)

(b.) "Could you share rides to work in a carpool?"

Replies:	Number of Responses	Percentage Distribution
Yes	337	30.0
No	319	28.4
No Answer	468	41.6
Total	1,124	100.0

Survey Question 47:
(continued)

(c.) "Would it be possible for you to walk to work?"

Replies:	Number of Responses	Percentage Distribution
Yes	343	30.5
No	379	33.7
No Answer	402	35.8
Total	1,124	100.0

Survey Question 47:
(continued)

(d.) Would it be possible for you to ride a bicycle?

Replies:	Number of Responses	Percentage Distribution
Yes	322	28.6
No	377	33.5
No Answer	425	37.9
Total	1,114	100.0

Survey Question 47:
(continued)

(e.) "Would you favor restricting students driving cars to high school?"

Replies:	Number of Responses	Percentage Distribution
Yes	659	58.6
No	166	14.8
No Answer	299	26.6
Total	1,124	100.0

Survey Question 47:
(continued)

(f.) "Would you be more likely to use the commuter park-and-ride lot now available?"

Replies:

	Number of Responses	Percentage Distribution
Yes	181	16.1
No	429	38.2
No Answer	514	45.7
Total	1,124	100.0

Survey Question 47:
(continued)

(g.) "Could your household voluntarily give up one day each week when none of the vehicles would be driven?"

Replies:

	Number of Responses	Percentage Distribution
Yes	450	40.0
No	278	24.7
No Answer	396	35.3
Total	1,124	100.0

Survey Question 47:
(continued)

(h.) "Would you favor a reduced speed limit on rural 2-lane highways?"

Replies:

	Number of Responses	Percentage Distribution
Yes	277	24.6
No	433	38.5
No Answer	414	36.8
Total	1,124	100.0

Survey Question 47:
(continued)

(j.) "Would a local car pool matching service be useful to you now?"

Replies:

	Number of Responses	Percentage Distribution
Yes	120	10.7
No	526	46.8
No Answer	478	42.5
Total	1,124	100.0

Survey Question 51: "Do you or anyone in your household commute to work outside the Hermann area?"

Replies:

	Number of Responses	Percentage Distribution
Yes	289	25.7
No	632	56.2
No Answer	203	18.1
Total	1,124	100.0

Survey Question 52: "If yes, how do you usually travel to work?"

Replies:

	Number of Responses	Percentage Distribution
Drive Alone	246	21.9
Carpool	140	12.5
No Response	738	65.7
Total	1,124	100.0

Survey Question 53: "How many miles (one way) do you travel to work?"

Replies:

	Miles Traveled					
	0-5	6-10	11-20	21-30	30+	No Answer
Number	413	49	48	65	80	469
Percentage	36.7	4.4	4.3	5.8	7.1	41.7
Percentage Disregarding No Answer	63.1	7.5	7.3	9.9	12.2	----

Before discussing the results of the Hermann survey, it should be noted that Hermann already has provided a commuter park-and-ride lot for its residents to use for car pool purposes. This will explain the difference in several of the questions between the Hermann and Owensville surveys. In general, the results of the Hermann survey agreed with almost all of the findings in the Owensville area. Hermann area residents were somewhat dissatisfied with the condition of streets in their respective communities. Opinions were almost evenly divided regarding the condition of sidewalks.

Shopping habits of Hermann residents indicate many essential purchases are made within the community, although 70% of clothing purchases were made outside the community. Approximately 24% of those surveyed stated they did not feel adequately informed concerning the impact a severe gasoline shortage would have on transportation in small cities and rural areas. If those who did not answer were eliminated from the total, then 46% would have been in the position of not feeling adequately informed on this subject.

Although only 10.7% of Hermann area residents were interested in a carpool matching service now, 30% indicated they would share rides to work in a carpool if there were a severe gasoline shortage. It is rather significant that 21.6% of the respondents indicated they could change to a 4-day work week in the event of a severe fuel shortage. If those who did not answer were eliminated from the total, then it would appear that 39% would be able to make this adjustment.

Slightly more than 30% of Hermann residents indicated they could walk to work if necessary, and almost 29% stated they could ride a bicycle. Hermann residents were found to strongly favor restricting students driving cars to high school during a fuel shortage. Furthermore, some 40% indicated their household could voluntarily give up one day each week when none of their vehicles would be driven.

Approximately 25% of those responding favored reducing the speed limit on rural 2-lane highways during a severe fuel shortage. If those not answering were eliminated from the total, then 39% would be in favor of this measure. The survey indicated that about 25% of the households had at least one worker who commuted to work outside the Hermann area. The majority of those traveling to work outside Hermann drove alone. Disregarding those who did not answer, 37% of Hermann area workers travel more than five miles to work.

CHAPTER 4. INSTITUTIONAL ARRANGEMENTS AND RECOMMENDED STRATEGIES FOR COPING WITH A GASOLINE SHORTAGE IN RURAL AREAS AND SMALL COMMUNITIES

The communication links and basic organizational structures for responding to a severe gasoline shortage in rural areas and small communities are basically in place at this time in the Meramec Region. What remains to be determined are the following:

A. Who should be the lead agency in the event of a petroleum shortfall?

B. Where should the personnel be located who would be sufficiently familiar with transportation systems that they could quickly implement a transportation fuels conservation program?

C. Who should be charged with the responsibility of preparing a contingency plan to be utilized if a future petroleum shortfall should occur?

It is one of the objectives of this study to outline the elements of a rural oriented transportation fuels contingency plan. It is also an objective to identify the major participants and responsibilities of those participants in responding to a shortfall. Using the data acquired and reviewed in this investigation, the desired institutional arrangements and fuel conservation measures for the Meramec Region will be presented. It is possible that these arrangements and conservation measures would have application in other rural regions of Missouri, and perhaps in rural areas of other states.

Institutional Arrangements:

What appears to be needed in rural areas in order to adequately prepare for a gasoline shortfall and to implement the most beneficial strategies is a rural version of the urbanized area Metropolitan Planning Organization. Supporting such an organization there would be a coordinated disaster planning and operations group, as well as another group capable of implementing an effective energy conservation education program. The lead agency in these actions should develop the response strategies and be capable of bringing them into effect when they would be required. Another important consideration is that the organization structure and communications links should be as straightforward and simple as possible. This is essential because it will be necessary to build the desired capabilities with the absolute minimum in manpower. Finally, the lead agency should be experienced in working with state-level agencies, and in particular they should be readily adaptable to working with the agency that would be directing the fuel shortage responses for the entire State of Missouri from Jefferson City.

Upon reviewing the multitude of government organizations serving rural Missouri, it becomes apparent that we have a wide variety of capabilities, responsibilities and areas of influence for agencies that might be actively involved in a fuel emergency. Also complicating the situation is the fact

that there are far too many small-and-medium sized cities (close to 700 in rural counties) for each of them to have effective communication with any specific central office in Jefferson City. Furthermore, the rural cities,and even the counties, rarely have anyone on their staff who might be familiar with transportation system management. On the other hand, it should be observed that many rural cities and counties have disaster planning and operations personnel who are well trained in their specialty. At the county level the University of Missouri has a comprehensive network of extension staff members who are capable of presenting a variety of educational programs.

At the regional level, Missouri has 20 regional planning commissions who are intimately familiar with the socio-economic characteristics and the problems of their member cities and counties. Considering the experience and the highly developed rural and small community interactions characteristic of the regional planning commissions in Missouri, it is clear that the only logical choice for lead agency in fuels contingency planning and fuel conservation actions in rural areas would be the regional planning commission, or perhaps groups of regional planning commissions. The suitability of any specific regional planning commission for this role would depend somewhat on the level of support it receives from its constituency and its history of involvement in transportation related activities. To further explore the benefits associated with utilizing the regional planning commissions the following support is presented.

Regional planning commissions covering the entire rural area of Missouri are typically composed of elected representatives of local governments with occasional volunteers representing business, labor or economic sectors of the region who also serve as members. These board members form the commission's governing board and have full responsibility for guiding agency activities. They meet regularly to determine areawide goals; they establish their own bylaws, internal operating procedures and budgets; and they may hire an executive director and other staff members as required for the commission's activities. According to the enabling legislation for Missouri regional planning commission, the various types of work they may become involved in are:

A. Conduct research studies.

B. Collect and analyze data.

C. Prepare maps, charts and tables.

D. Make plans for the region's physical, social and economic development.

E. Adopt these plans, or portions of them, by resolution as recommendations for regional action.

F. Publish and distribute reports on the commission's purposes.

G. Coordinate programs and activities which relate to regional objectives.

The commission's function is primarily in an assistance and advisory capacity to the local governments and officials. They are designated as the areawide clearinghouse for the "A-95" review system, so they have the opportunity to evaluate and comment on all proposals which involve federal assistance in their region.

Missouri regional planning commissions receive financial support from local, state and federal sources. Local revenues are derived from membership assessments and from fees for local technical assistance they provide. Planning commissions are eligible to receive federal grants which support specific programs and projects, and they receive state funds in the form of annual payments authorized by the Missouri General Assembly. To emphasize the potential regional planning commissions have for becoming actively involved in transportation fuels emergency activities, further details will be presented for the Meramec Regional Planning Commission. Located in Rolla (Phelps County) the MRPC headquarters has a staff of about 25 members and an Executive Director. The commission membership is made up of 21 cities, six counties and representatives from the following groups: Aging, Agriculture, Education, Industry, Labor, Minority Population, Small Business, and the Unemployed. Projects and reports prepared by the MRPC which are related to transportation, economic activity, and/or area development are typified by the following:

A. "The Meramec Regional Public Transit Plan," draft 1981.

B. "Capital Improvements Study, Vol. 3, Capital Improvements, 1980-1982," June, 1980.

C. "Potosi Missouri Comprehensive Plan Update," May, 1979.

D. "Meramec Region Emergency Services Directory," June, 1979.

E. "Pea Ridge Impact Area: A Redevelopment Strategy," July, 1979.

F. "Overall Economic Development Program," 1977 update.

G. "Crawford County Facilities and Services Study," June, 1976.

H. "Transportation Facilities Volume 1: Inventory of the Meramec Region," June, 1975.

In addition to the above studies, the MRPC cooperated with the Missouri Department of Transportation in preparing the "Meramec Region Transit Development Program" in 1978. Beginning in August, 1979, the MRPC has been involved in studying the aviation needs of the six county region. The technical aspects of the study were handled by an engineering consulting firm; however, MRPC was active in the data acquisition tasks, and coordinated the citizen participation for the study. As a planning and advisory agency the MRPC has been involved in numerous practical projects which have not necessarily been documented in published studies or reports. Undoubtedly, there have been and will continue to be many activities of the MRPC which will

involve the more technical aspects of transportation engineering and transportation planning. Transportation is clearly vital to the economic well being of each of the counties in the region and MRPC activities in this arena should be encouraged. It is possible that the MRPC should seriously consider hiring an individual with advanced specialized training in the civil engineering and/or transportation engineering discipline. There are many activities that a transportation professional could be involved with at this time that would constitute a definite positive contribution toward improving the transportation system efficiency in the region.

Considering other institutions in the Meramec region which would become actively involved in preparing for an energy emergency, it is quite important to recall that each county currently has an appointed Energy Officer and coordinator/director. The Disaster Planning and Operations Office (Missouri Department of Public Safety, Office of the Adjutant General) maintains a current list of the city and county executive officers and director/coordinators who are active in their statewide emergency preparedness network. These individuals are trained to primarily handle man-made and natural disasters, and to implement war time civil defense measures. In Phelps County the coordinator is the Deputy Sheriff and he is officially designated the County Energy Officer. This appears to be an excellent choice for the location of the Energy Officer since the Sheriff's office is available for 24-hour a day communications by telephone, has radio-dispatched vehicles, and is tied into the statewide law enforcement emergency communications system. Furthermore, the Phelps County Sheriff's office maintains the "Emergency Preparedness Transportation Plan" for the county. During the 1979 petroleum shortfall, the Phelps County Energy Officer also established an inventory of fuel distribution, station outlets, hours of service, fuels carried, and emergency equipment that would be available. The major purpose of the inventory was to be prepared to assist motorists who might be stranded with no fuel and to locate a service station for them that would meet their needs.

Another institution that would have a role to play in preparing for a fuel emergency is the University of Missouri Cooperative Extension Service which is active in all counties of the Meramec Region. Their staff includes specialists in "local government" and "community development". Of course, the extension service can draw upon the faculty of the entire University of Missouri system to assist in educational programs as the need arises. The Meramec Area Extension Service has already been engaged in programs such as a Rural Street and Road Maintenance Short Course and in an Ethanol Production Seminar. They have also brought a traveling educational van into the area which contains demonstrations and video-tapes on energy conservation. This vehicle traveled in the region for several weeks during the summer preceded on its route by newspaper and radio announcements. It typically parked at a shopping center lot, or other conspicuous locations, to attract visitors in the small communities. This vehicle is actually a self-contained classroom with expandable exterior stage mounted on its side. Undoubtedly the touring van and energy conservation seminars available through the Extension Service would be extremely valuable in transmitting ideas on fuel-saving

driving techniques, trip planning, vehicle maintenance, and ridesharing to the residents of small communities.

In summary, the recommended institutional arrangements for coping with a transportation fuels shortage in rural areas are the following:

A. The regional Planning Commission (RPC) is the intermediate coordinator between the Division of Energy Office, Missouri Energy Emergency Center, in Jefferson City and all the member cities and member counties in their geographical area.

B. The Area Cooperative Extension Service should work with the RPC to facilitate small community and rural fuel conservation training programs being developed and implemented. Arrangements for this to occur would have to involve the Executive Director of the RPC and the Area Director for the Extension Service.

C. The County Energy Officer should actively cooperate with the RPC by providing information concerning fuel supplies, station operations in the county, and provide notice of any difficulties that may arise due to low supplies. The County Energy Officer should be housed in the County Sheriff's Office whenever it is practical to do so. In those locations where a City Energy Officer has been appointed, some responsibilities should be shared by that office. However, the County Sheriff's office should still be the focus for all enforcement activities related to station operations, supplies and motorist assistance.

In order to bring the recommended institutional arrangements into existence, it is strongly recommended that the RPC establish a "Mobility Advisory Committee." This committee would be concerned with the following activities in the region:

A. Coordination of public transportation services.

B. Promotion of ridesharing efforts.

C. Coordination of freight movements.

D. Transportation needs of special groups (as elderly, handicapped, etc.).

E. Fuel suppliers and station operators.

F. Street and road network maintenance.

G. County and City Energy Officers.

H. Vehicle maintenance specialists.

I. Large employment centers.

An advisory committee of this nature would be extremely beneficial for assisting in the development of a specific regional/small city/rural area transportation fuels emergency plan.

Recommended Strategies for Reduced Gasoline Consumption:

The following fuel conservation measures are recommended for application in the Meramec Region. It is assumed that MRPC would remain in close contact with the Missouri Energy Emergency Center in the Department of Natural Resources, Division of Energy, during the implementation and promotion of the recommended fuel conservation strategies. Furthermore, the MRPC would continue interaction with each community and county in their region regardless of their size. The strategies are presented in the order in which action should be initiated, although in a severe fuel shortage action on all of the recommended strategies should be initiated as soon as possible.

A. Commuter Parking Lot Development: This measure is intended to serve the intercity commuter, but would also be of value for other types of trips for persons desiring to travel between towns for purposes other than work. Existing surfaced lots located close to a major highway, preferrable at the edge of town, would be the best choice for a commuter lot. If the lot is privately owned, cooperation of the owner must be secured and a specific area should be marked for park-and-pool vehicle storage. The location of the commuter lot should be advertised in the newspapers and on the radio.

It is interesting that the Missouri Department of Highways and Transportation has 74 of these park-and-pool lots already in operation, with close to a total of 4,000 spaces available. In addition to these park-and-pool lots, many informal arrangements have been made for park-and-pool rendezuous points. A church on Highway 63 in Vienna accommodates about 17 vehicles (mostly older pick-up trucks) daily, and a brief survey of Rolla revealed there were at least 4 locations being used for 9 carpools carrying 48 people.

Matching of riders and vehicles for expanding use of park-and-pool facilities would probably be best handled at a ridesharing coordination center in the interest of confidentiality. When the lot or section of lot is signed for park-and-pool use, the sign should also carry the legend "FOR CARPOOL INFORMATION CALL 1-800-XXX-XXX" which would put interested parties in contact with the Regional Ridesharing Coordinator. As a long term measure, the Regional Planning Commission should identify locations for park-and-pool lots to be constructed and attempt to promote construction of the facility. The least expensive course of action would be to coordinate park-and-pool lot development for the placement of new private or public developments that would also have to provide parking for their own purposes. It would also be desirable to place park-and-pool lots close to bus stations in those communities where intercity buses do provide service.

B. Ridesharing Coordination Offices: A regional ridesharing coordinator should be established in the MRPC headquarters at Rolla. A toll-free telephone service should be installed and advertised throughout the region, with notices sent to major employers regarding the service. Satellite ridesharing centers should also be established in cities whenever a suitable location could be found and volunteer assistance located. Hours of operation of the ridesharing centers should probably have to be determined on a location-by-location basis, however, it is recommended that the facility be open some evening hours (say to 7:00 p.m.) so it would be capable of receiving requests from those who are at work from 8:00 a.m. to 5:00 p.m. Local ridesharing coordinators should have adequate training with respect to their duties. It is possible that the elderly and handicapped transportation providers (SMTS and OATS) could be contacted for the use of their local coordinators. All ridesharing coordinators should be provided with a map mounted and coded by a grid as on a ride board. In rural areas, the Missouri Department of Highways and Transportation (MDHT) General Highway Maps would be ideal for a ride board. A portion of one of these maps for Phelps County is shown in Figure 5 with a hypothetical matching grid superimposed. The General Highway Maps are available from MDHT Division of Planning in Jefferson City (314-751-3758) for 15 cents each. These maps would be especially helpful in assisting rural and small town residents since they show numerous man-made features including hospitals, homes, bridges, manufacturing plants, and all classes of highways. The size of ride board which would be required for each county and for the region is given in Table 24. The MDHT map is at an approximate scale of 1" = 2 miles, and the recommended dimensions would accommodate each map with an allowance of at least four inches for a margin on each side. Several of the recommended sizes have been adjusted to be larger than absolutely necessary to provide some standardization in the size of materials that would be required.

TABLE 24. RECOMMENDED RIDE BOARD MINIMUM SIZE USING GENERAL HIGHWAY MAPS

	Ride Board Size	
	Width, Inches	Height, Inches
Crawford County	21	28
Dent County	28	21
Gasconade County	16	28
Maries County	21	18
Phelps County	21	28
Washington County	21	28
Region	50	54

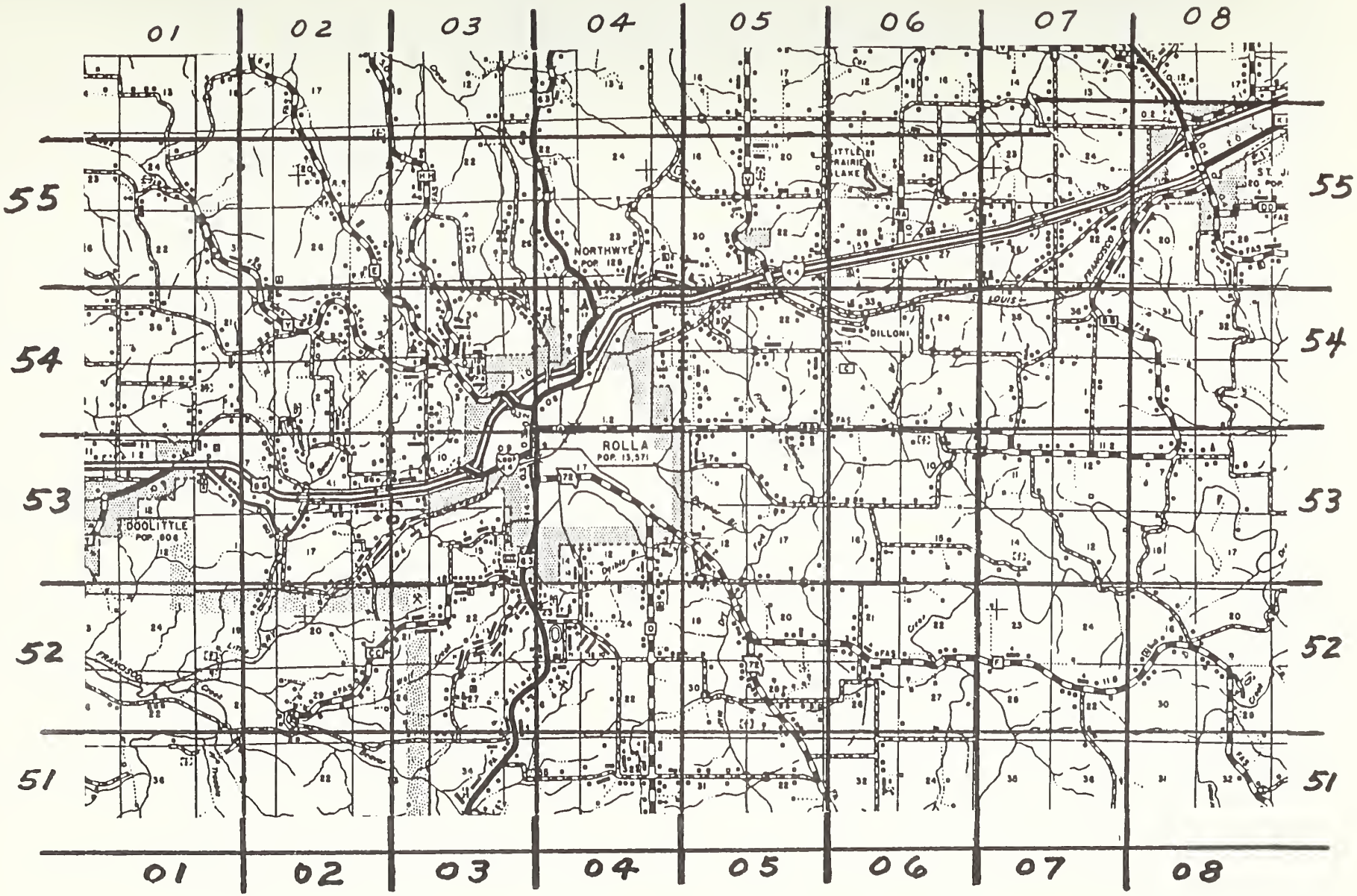


FIGURE 5. ILLUSTRATION OF RIDE BOARD MAP WITH MATCHING GRID FOR RIDESHARING

The ridesharing system that is recommended would be dependent on a manual matching process; however, the input data received from each participant would have to be in a format suitable for conversion to the system used by the DIAL-A-RIDE Car Pool Matching Service (1-800-392-0717) in the Division of Energy at Jefferson City. Data obtained from each ridesharing applicant should include:

A. Name of applicant _____
B. Address of applicant _____
C. Home telephone of applicant _____
D. Number of riders from home of applicant _____
E. Work hours: Start____a.m. ____p.m. End____a.m. ____p.m. (enter specific time)
F. Desire of applicant to ____drive ____ride ____both
G. Name of employer _____
H. Address of employer _____
I. Telephone of employer _____
J. If driving, what is remaining passenger capacity _____
K. What year, make of vehicle, would be driven _____
L. Non-smokers only: ____yes ____no
M. Route taken, potential rendezvous points enroute _____
N. Code of origin zone (by coordinator) _____
O. Code of destination zone (by coordinator) _____
P. Code of rendezvous points (by coordinator) _____

The ridesharing coordinator should code each card using the following designation:

AA, NNNNN, AAOOOO, AADDDD, AARRRR

where: AA = County code, as CR for Crawford
NNNNN = Number of applicants from that county
AAOOOO = Code of origin (county, horizontal grid number, vertical grid number)
AADDDD = Code of destination, (could be outside of origin county)
AARRRR = Code of rendezvous point (could be outside of origin county)

The applicants card would be retained in a master file organized by the AA, NNNNN designation. Another master list would have to be maintained giving last names associated with the "AA, NNNNN" designation. Then separate lists could also be manually maintained showing all applicants with common or close "AA, DDDD" designations. If potential rendezvous points were available, there should also be "AA, RRRR" list manually maintained. This system would have the potential of matching riders who came from different origins (as would be expected in low-density populated areas) but who might travel similar paths going toward reasonably close destinations. When a match is established, another file should be established according to the lowest "AA, NNNNN".

designation in the resulting carpool. The Regional Ridesharing Coordination Office should establish the grid coding for all ride boards used in the county so all coordination offices would be able to exchange information.

C. Establish Regional Information Center: The MRPC should cooperate with the Division of Energy and the Meramec Area Cooperative Extension Service in distributing educational materials pertaining to transportation fuel conservation practices. Booklets and articles such as the following should receive widespread distribution:

A. "Get More Missouri Per Gallon, Money Saving Tips for Missouri Motorists," Missouri Department of Natural Resources.
B. "1981 Gas Mileage Guide," U.S. Environmental Protection Agency, U.S.G.P.O. 1980- 326-653 (or more recent edition).
C. "Driving Smarter: To Go Farther For Less," series of five articles appearing in the Energy Insider, U.S. Department of Energy.
D. "Three Rules for Maximum Tire Life, Including Load and Inflation Tables," Shell Oil Company, 1973.
E. "Commuter Parking Lot Location Guide," and Additions Sheet, Missouri Highway and Transportation Dept., updated January, 1981.
F. "Shell Answer Book," numerous issues as:
    1. "The Early Warning Book".
    3. "The Gasoline Mileage Book".
    5. "The 100,000 Mile Book".
    6. "The Rush Hour Book".
    17. "The Self-Service Book."
    18. "The Tune-Up Book."
    19. "The Gasoline Book."
    24. "The More Miles for Your Money Book."

A limited distribution of the following documents should be handled by the Regional Information Center to appropriate officials or groups in the region:

A. "Handbook of Traffic Engineering Practice for Small Cities," Federal Highway Administration, Missouri Division Office, Jefferson City.
B. "Fuel Economy Through Teamwork," Energy Savings in School Transportation Series, U.S.D.O.T., Washington, D.C. Vols. 1,2,3,4,; October, 1977.
C. "Encouraging School Transportation Effective Energy Management," Voluntary Truck and Bus Fuel Economy Program, U.S.D.O.T., Washington, D.C., October, 1977.
D. "How to Save Truck Fuel", Voluntary Truck and Bus Fuel Economy Program, U.S.D.O.T., Washington, D.C., 1980.
E. "Fuel Alcohol on the Farm, A Primer on Production and Use," U.S. National Alcohol Fuels Commission, Washington, D.C., 1980.
F. "Alcohol Fuel Packet", Division of Energy, Missouri Department of Natural Resources, Jefferson City, 1980.

G. Urban Consortium for Technology Initiatives Reports, Public Technology Initiatives Report, Public Technology, Inc., Washington Washington, D.C.
   1. "Alternative Work Schedules", 1978.
   2. "Integration of Para-Transit with Conventional Transit Systems", 1978.
   3. "Taxicabs as Public Transit," 1978.
   4. "School Bus Use for Non-School Transportation."

H. "Paratransit State of the Art Overview, U.S.D.O.T., Transportation Systems Center, Cambridge, MA, March, 1981.

I. "Handbook on Financing Options for Diagnostic Inspection Programs," National Highway Traffic Safety Administration, U.S.D.O.T. December, 1979.

J. "How Ridesharing Can Help Your Company, A Manual for Employers", U.S.D.O.T., Washington, D.C., May, 1979.

K. "Bikeways-State of the Art," Federal Highway Administration, U.S.D.O.T., Washington, D.C., 1974.

L. "A Pedestrian Planning Procedures Manual," Federal Highway Administration, U.S.D.O.T., Washington, D.C., 1978.

M. "Energy Conservation in Transportation," U.S.D.O.T., Transportation Systems Center, Cambridge, MA. January, 1979.

There are also several technical publications which would be valuable for city engineers, county engineers or public work directors. They are:

A. "A Training Manual for Setting Street Maintenance Priorities," Texas Innovation Group, Texas A & M University, College Station, Texas, August, 1979.

B. "User Guide for Removal of Not Needed Traffic Signals," Federal Highway Administration, U.S.D.O.T., Washington, D.C., November, 1980.

C. "Yield Sign Usage and Application," ITE Informational Report, ITE Journal, October, 1978.

D. "Design and Traffic Control Guidelines for Low-Volume Rural Roads," Appendix H, "Intersection Stop Control," NCHRP Report 214, TRB, Washington, D.C., October, 1979.

E. "Bridges on Secondary Highways and Local Roads," NCHRP Report 222, TRB, Washington, D.C., May, 1980.

F. "Selecting Traffic Signal Control at Individual Intersections," NCHRP Report 233, TRB, Washington, D.C., June, 1981.

G. "Optimizing Street Operations Through Traffic Regulations and Control," NCHRP Report 110, TRB, Washington, D.C., 1970.

H. "Effect of Traffic Control Devices on Traffic Operations," NCHRP Report 41, TRB, Washington, D.C., 1967.

In addition to transmitting general and technical information to the general public, employers and local officials, the Regional Information Center would receive status reports from the County Energy Officers regarding gasoline supplies, and station operation practices. Any new directives coming from the Division of Energy should be distributed to small cities and rural areas through the Regional Information Center.

D. Promotion of Walking and/or Bicycling: The MRPC should assist local businesses in promoting employee walking and bicycle riding to and from work. This should be a reasonably practical alternative in small communities, especially those with adequate sidewalks and space for bicycles on city streets. A bicycle access study should be performed to determine if there are certain streets which ought to have some parking removed to aid in developing a safe continuous route to the employment center. Also, the condition of sidewalks should be evaluated to determine if there are some critical links missing. Both bicycle access and sidewalk condition should be assessed close to educational facilities. This measure would have substantial influence on the fuel used in a small community, and each employee who could reasonably be expected to walk or ride a bicycle should be encouraged to do so.

E. Employer-Based Ridesharing Coordination: Each employer in the Meramec Region should promote carpools within his organization for those who are not able to walk or ride a bicycle to work. The potential for employer-based carpool development in the Meramec Region is shown in Table 25. These data from the Missouri Division of Employment Security do not cover all employees in the region, however, they do indicate we have at least 25,127 employees working at 2,037 employment units, giving an average employment density of about 12.3 employees per firm. In those organizations with 10 or more employees there should certainly be some potential for car pooling. According to a recent nationwide travel survey which included data on why people do not car pool, there were only two significant factors in discouraging car pooling. As shown in Table 26, these factors are "Irregular Work Hours" and "Don't Know Anyone." Employers could do much to eliminate these two possible sources of objection to car pooling.

Employers could also exchange information with other nearby employers regarding car pool needs if they were located in an industrial park, a shopping center, or a central business district. Wherever there is a cluster of forms an Employer-Based Rideshare Coordinator should be appointed, or the city should appoint a Rideshare Coordinator that would allocate special attention to employment centers. It is possible that a ride board could be utilized in this case, but at least rider/origin/destination application cards should be completed according to the Regional Ridesharing Coordination code. Once data on vehicle origin, path and destination are available for each person, and matches are made, the information should be copied and forwarded to the Regional Ridesharing Center. Also, where there are clusters of employees amounting to 20 or more, employers should be encouraged to explore the possibility of acquiring a van which they could use in their business, which could also be used for employee transportation to and from work.

F. Public Transportation Promotion: In those communities where public transportation services might be feasible, a local transit demonstration project could be implemented for several months to service the central business district, shopping centers and industrial parks. This is likely to be a high-cost alternative, although losses could be somewhat offset by

TABLE 25. SIZE AND NUMBER OF EMPLOYERS, MERAMEC REGION

Industry Division	Number of Employment Units	Number of Employees	Average Employees per Unit
Agriculture, Forestry and Fisheries	25	265	10.6
Construction	220	825	3.8
Finance, Insurance and Real Estate	120	721	6.0
Manufacturing	150	5,507	36.7
Mining	28	784	28.0
Other	142	2,102	14.8
Retail Trade	608	4,440	7.3
Services	486	8,072	16.6
Transportation and Utilities	137	1.189	8.7
Wholesale Trade	121	1,222	10.1
Region Total	2,037	25,127	12.3

Source: Missouri Division of Employment Security, special computer run for Month 2, Quarter 2, 1980.

TABLE 26. PERCENT DISTRIBUTION OF REASONS FOR NOT CARPOOLING ACCORDING TO WORKER'S OCCUPATION

Reason For Not Carpooling	Type of Employment					All
	Private Company	Government	Self-Employed Incorporated	Self-Employed Not Incorporated	Working Without Pay	
Irregular Work Hours	28.9	27.5	39.6	37.3	19.5	29.0
Irregular Work Location	3.6	3.6	6.9	0.0	2.5	3.7
Need Car for Work	5.0	5.1	15.8	6.9	4.4	5.4
Out of Way to Pick Up People	7.0	7.7	1.9	0.0	5.8	6.9
Riders Not Dependable	1.0	0.7	0.0	0.0	0.0	0.9
Prefer to Have Car Available	3.2	4.3	3.1	0.0	4.9	3.4
Like Privacy	2.0	1.7	1.1	0.0	2.1	1.9
Don't Know Anyone	22.7	19.9	10.9	7.2	20.2	21.6
Don't Trust Others Driving	0.0	0.1	0.0	0.0	0.0	0.1
Don't Want to Call Others	0.6	0.6	0.6	0.0	0.0	0.6
Other	5.0	6.4	7.2	16.8	5.9	5.4
No Answer	21.0	22.4	12.9	31.8	34.7	21.1
Total Workers	100.0	100.0	100.0	100.0	100.0	100.0*

*Total number of workers = 65,735,000 (79,214,000 less 13,479,000 in carpools)

Dource: Home-to-Work Trips and Travel, Report No. 4. Nationwide Personal Transportation Study, '77. FHWA, USDOT, Office of Highway Planning, December, 1980, pg. 75.

rider fees and employer contributions. A bus subscription service could be attempted; or a subscription service combined with point-deviation routing (scheduled stops at specific locations, but off-route-deviations possible). School buses would probably not be available for such a project if the buses were owned by the school district. However, private contract carriers could lease their buses for a project of this nature. Alternatively, SMTS or OATS could be contracted to determine if they could establish a work-trip schedule prior to and following their provision of service to the elderly and handicapped. SMTS and OATS have limited fleets of vans, however, and there may be only one van in the entire county. Some churches have vans which could probably be leased on a short term basis for a demonstration project. Another alternative would be for the city and/or businesses to buy or lease one or more vans from an automobile dealer in the community. The local taxi companies should be approached regarding their interest in a share-ride promotion, with the possibility of establishing several fixed-route subscription services.

G. Assist School Districts in Gasoline Conservation: Most school districts have been actively interested in fuel conservation for their buses for many years since their budgets seem to be waging a losing battle against inflation. However, the school district may wish to explore the possibility of computer-aided bus routing and/or the possibility of a faculty/staff/student car pool service. The school district may have to face a decision on going to a 4-day week, or possibly extended vacations during the coldest months. Also, plans should be implemented to coordinate schedules for athletic events, so different teams could travel for events to a common destination on fewer buses. The school district should promote spectator travel to sports events by charter bus. It is quite possible that athletic events, as well as other extracurricular activities, could be continued with slight modification if proper conservation measures were taken. Each school district should appoint a Transportation Energy Officer to coordinate with the Local and Regional Ridesharing Coordinators, and to work with other school districts in scheduling events and transportation.

H. Traffic Flow Improvements: If it would be possible for the MRPC to acquire a staff person with technical training in traffic engineering and transportation planning, he would be able to provide a vital service in preparing for a severe gasoline shortage and in implementing the proposed strategies. Furthermore, such an individual could assist the cities in the technical problems covering traffic control devices, traffic safety, access to traffic generators, bicycle route development, and transit system promotion. If a civil engineer with a general background could be acquired, he would also be quite capable to advise with respect to water supply problems, sanitary engineering problems and solid waste disposal.

Concluding Remarks:

The above list of recommended strategies is by no means comprehensive. However, for implementation at the rural and small community level, these strategies would be all that one could reasonably expect to be implemented

with a small staff (probably most being volunteers). Punitive strategies, such as the Mandatory Sticker Plan and a Vehicle Idling Limit, etc., have been omitted since they seem to create a negative reaction, and this should be avoided. The fuel conservation strategies should be as "positive" as possible, with a plea for cooperation accompanied by suggestions and incentives associated with reasonable alternatives for conserving fuel.

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APPENDIX A

LOCAL GOVERNMENT OFFICIALS SURVEY COVER LETTER

UNIVERSITY OF MISSOURI-ROLLA

Transportation Institute
Director: Dr. Charles E. Dare
308 Engineering Research Laboratory
Rolla, Missouri 65401
Telephone: (314) 341-4553
(314) 341-4451

August 1981

TRANSPORTATION FUELS CONSERVATION FOR SMALL CITIES AND RURAL AREAS

In the event of a serious gasoline shortage, it is certain that each community would have to take immediate and significant actions to reduce the quantity of fuel consumed in their locality. It is possible that an international incident could eliminate as much as 40 percent or more of our petroleum supply, and it is also possible under such circumstances that the United States might have to export some of her domestic petroleum supply to friendly nations.

Rural areas and small cities are basic to the agricultural and industrial strength of our nation. Activities including crop production, livestock raising, lumbering, and mining would have to continue regardless of the petroleum situation. Yet, there has not been sufficient attention given to the potential consequences of a serious gasoline shortage on the vital functions carried on in rural areas and small cities. Numerous strategies for reducing fuels used in urbanized areas have been evaluated. These include actions ranging from general information programs to regulations that would ban all vehicles of a household from driving on a specific day each week. Many people believe that the gasoline conservation plans developed for urban areas would not be especially appropriate or effective in rural areas and small cities.

In view of the apparent lack of preparation for a severe gasoline shortage in rural areas and small cities, we would like to ask your cooperation in our study of this potentially serious problem. If you would please answer the following questions, perhaps taking two or three days to consider your responses as you go about your administrative duties, and then send the completed survey to the address below, we would be most appreciate! We are looking forward to hearing from you, and wish to extend our thanks for the time and effort that may be expended.

Charles E. Dare

Charles E. Dare
Room 306 ERL, Transportation Institute
Univ. of Missouri-Rolla
Rolla, Missouri 65401

(If you have any questions regarding this document please call 314-341-4553.)

APPENDIX B

TELEPHONE INTERVIEW ON GASOLINE SHORTAGES
IN RURAL AREAS

INTRODUCTION:

Hello. May I please speak with the head of the household?

Hello (if necessary). My name is _____.
I'm doing a survey for the Meramec Regional Planning Commission (or University of Missouri, Rolla) on planning for emergency gasoline shortages. Your home was selected at random and I would like to take a few minutes to ask you some questions.

Is this a convenient time?

If NO, When may I call you back? _____.

If Yes,

Let me assure you that your name will not appear on any of our printed information.

IF RESPONDENT HESITATES, ASSURE HIM/HER THAT THE SURVEY IS SPONSORED BY THE MRPC: THAT ALL ANSWERS ARE CONFIDENTIAL AND WILL BE USED ONLY FOR STATISTICAL PURPOSES: AND THERE WILL BE NO FURTHER INVOLVEMENT.

IF STILL UNSURE: OFFER A NAME AND NUMBER, DR. CHARLES DARE, TRANSPORTATION INSTITUTE, UNIVERSITY OF MISSOURI, ROLLA, PHONE: (314) 341-4553.

DATE _____

INTERVIEWER _____

SUBJECT CALLED _____

COUNTY _____

NEAR CITY _____

SURVEY NUMBER _____

PART I

1. Do you feel the government has adequately informed you about the seriousness of the energy supply problem?

   1. 1. Yes ____
      2. No ____
      3. Not sure ____

2. Suppose there was a 50% gasoline shortage to save gasoline would you be willing to make any of the following changes: This requires a yes or no answer, but could you also indicate if you've already made any of these changes?

	2.	YES	NO	ALREADY	N/A
1. Would you buy a better gas milage vehicle?	1.	___	___	___	___
2. Would you maintain your vehicle better?	2.	___	___	___	___
3. Could you bicycle to work?	3.	___	___	___	___
4. Walk to work	4.	___	___	___	___
5. Would you be able to combine grocery shopping with other trips?	5.	___	___	___	___
6. Would you ride a bus to work if one were available?	6.	___	___	___	___
7. Would you convert your vehicle to propane fuel?	7.	___	___	___	___
8. Would you purchase any gas saving device for your vehicle? (ie; low-friction oil raidal tires)	8.	___	___	___	___

3. Would you drive slower according to a lower speed limit on 2-lane highways?

   (IF NO, GO TO QUESTION 5.)
   (IF YES, TO TO QUESTION 4.)

   3. 1. Yes ___
      2. No ___
      3. N/A ___

4. Since you said yes that you would drive slower on two lane highways, how slow a speed limit do you think reasonable below the present 55mph limit?

   4. 1. _____ mph

5. If gasoline is very scarce, do you feel road maintance should be improved or should we delay in fixing the roads?

5. 1. Improve ___
2. Delay ___
3. No Opinion ___

6. Would it be possible for you to change your work schedule to a 4-day work week?

(NOTE: ask about primary wage earner if respondent is a non-worker)

6. 1. Yes ___
2. No ___
3. Not sure ___
4. N/A ___

7. Do you or your spouse share rides with friends or neighbors for non-work trips? (for example, shopping)

(IF YES, GO TO QUESTION 10.)
(IF NO, GO TO QUESTION 8.)

7. 1. Yes ___
2. No ___

8. Would you be able to share rides or carpool, if there was a 50% gasoline shortage?

((IF YES, GO TO QUESTION 9.)
(IF NO, GO TO QUESTION 10.)

8. 1. Yes ___
2. No ___

9. Would the rides you share be for work or non-work trips or both?

9. 1. Work ___
2. Non-work ___
3. Both ___

PART II

10. How many vehicles are available for the people in your home?

(IF ZERO, CONTINUE BUT DON'T ASK QUESTIONS 20 & 21)

10. #_____
No response ___

11. How many people in your home are wage earners?

(IF ZERO, GO TO QUESTION 20, AND DON'T ASK QUESTION 23)

11. #_____
No response ___

12. Does the primary wage earner travel to work or work at home?

(IF 1. WORKS AT HOME, GO TO QUESTION 15.)
(IF 2. TRAVELS TO WORK, GO TO QUESTION 13)
(IF 3. NO RESPONSE, GO TO QUESTION 15.)

12. 1. Home ___
2. Travels ___
3. No Response ___

13. Since he/ she travels to work, how does he/ she travel?

13.

1. Uses own car 1. ____
2. Carpools - shares rides 2. ____
3. Bus 3. ____
4. Walks 4. ____
5. Bicycle 5. ____
6. Taxi 6. ____
7. No Response 7. ____

14. (ASK ONLY IF USES OWN CAR OR CARPOOLS OTHERWISE, GO TO QUESTION 15)

Does he/ she use this car just to get to work or work or is it being used for business travel? for example as an electrician,

14.
1. Just to get ____
2. Business travel ____
3. No Response ____

15. Except for the primary wage earner, how do the other wage earners travel to work?

(DON T ASK IF THERE IS ONLY ONE WAGE EARNER)

15. Place Code On Line

WAGE EARNER	CODE
1	1 uses own car 2 carpool/share rides
2	3 bus
3	4 taxi 5 walk
4	6 bicycle
5	7 works at home 8 no response

1. ____
2. ____
3. ____
4. ____
5. ____

16. (ASK ABOUT SPOUSE, IF SPEAKING TO A NON-WORKER)

Is there a place on your (spouse's) way to work which would be used as a commuter parking lot? (If necessary explain; a place where you and a friend could meet and park one of the cars, and then drive the rest of the way together.)

16.
1. Yes ___
2. No ____
3. Already have a place ____
4. No response ____

(IF YES, GO TO QUESTION 17., BUT SKIP 19.)
(IF NO OR NO RESPONSE, GO TO QUESTION 20.)
(IF ALREADY HAVE A PLACE, GO TO QUESTION 17.)

17. Where is this place? (major intersection or shopping center)

17. By hand

_____

_____

18. Where do you work? (what city)

(IF RESPONDENT HESITATES, REMIND HIM/HER ALL RESPONSES ARE CONFIDENTIAL)

_____

18. By hand

19. How many people meet at this place?

19. 1. _____
2. no response _____

20. Suppose a plan for saving gasoline required each family to choose one day of the week when they could not drive any of their vehicles, what day of the week would you choose?

20. Check appropriate number

1. Sunday — 1. ____
2. Monday — 2. ____
3. Tuesday — 3. ____
4. Wednesday — 4. ____
5. Thursday — 5. ____
6. Friday — 6. ____
7. Saturday — 7. ____
8. No Response — 8. ____

21. Do you feel such a plan is good, bad or do you feel indifferent about it?

21.

1. Good (worth the inconvenience to save gas) — 1. ____
2. Bad (may cause hardships, so not worth it) — 2. ____
3. Indifferent? — 3. ____

22. Do you have any ideas or suggestions for conservation of gasoline during a severe shortage?

22. By hand

_____

_____

_____

PART III

23. What is the primary wage earner's occupation?

(IF RESPONDENT HESITATES, REMIND HIM/HER THAT ALL RESPONSES ARE CONFIDENTIAL)

1. Agriculture/Forestry
2. Mineral Extraction
3. Construction
4. Manufacturing
5. Trade
6. Services (professional & business)
7. Communications
8. Finance, Insurance & Real Estate
9. Transportation & Utilities
10. Public Administration
11. No Response
12. N/A

23. Check Appropriate Category

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____
7. ____
8. ____
9. ____
10. ____
11. ____
12. ____

24. Sex (FROM VOICE, DON'T ASK)

24. 1. M ____
2. F ____

25. Do you live out of town, in town or on the edge of your town?

(EDGE OF TOWN - 3 BLOCKS OR ¼ MI. FROM CITY LIMITS)

25. 1. Out of town ____
2. In town ____
3. Edge of town ____
4. No response ____

26. IF OUT OF TOWN, What is the nearest major intersection?

_____

26. By hand

APPENDIX C

Owensville Community Survey

Dear Friend,

PLEASE READ CAREFULLY BEFORE COMPLETING THIS SURVEY

We all want to see our community move forward and keep pace with the rapidly changing world; however, no degree of progress or civic accomplishment is possible without the cooperation and assistance of all the citizens of the Owensville area.

This questionnaire has been designed to give you an opportunity to register your opinions and attitudes regarding life you find here. From the answers which you and other citizens give, community leaders will receive guidance and directions in the overall task of making Owensville a better place in which to live.

YOUR ASSISTANCE IN THIS MATTER IS VERY IMPORTANT

You need not sign your name to this questionnaire, but please give your honest and sincere opinions. All the questions are matters of opinion; therefore, there are no right or wrong answers. Complete all the questions to the best of your ability: and in cases where you do not know the answer, or have no opinion, check the "no opinion" box.

You may answer with assurance that your identification with this survey will never be revealed.

VOLUNTEERS WILL BE COLLECTING THE COMPLETED SURVEYS THURSDAY EVENING, JULY 23, BETWEEN 5:30 P.M. AND 7:00 P.M.

Please have your survey completed and ready to be placed in the boxes provided by the survey collectors. If you do not plan to be home, please leave the survey with a neighbor or attached to your door, or it may be deposited at City Hall in a special box provided.

COMMUNITY SERVICES

1. Do you feel the following services in Owensville are satisfactory?
(Answer "yes" if you think so, "no" if you don't think so, "no opinion" if you are undecided, "don't know" if you don't know enough about the service to have an opinion).
Please answer for each of the items in the list.

Yes	No	No Opn	Don't Know

c. Street repair

⋮

l. Sidewalks

⋮

TRANSPORTATION

34. Do you feel that county roads are adequately maintained?
35. Would you support a tax increase for county road maintenance?
36. Do you feel adequately informed concerning the impact a severe gasoline shortage would have on small cities and rural areas?
37. Would a local car pool matching service be useful to you now?
38. Would you favor having the City initiate a local public transportation service coordinated with the OATS Van at this time?
39. Would you use a commuter park-and-ride lot if it were available now?

40. Suppose there would be a nationwide gasoline shortage and you had to reduce your gasoline use by 50%: (Please answer for each one)
   a. Could your work schedule be changed to a 4-day work week?
   b. Could you share rides to work in a carpool?
   c. Would it be possible for you to walk to work?
   d. Would it be possible for you to ride a bicycle to work?
   e. Would you favor restricting students driving cars to high school?
   f. Would it be useful to you to have a commuter park-and-ride lot available where you could meet other persons to share rides to other towns?
   g. Could your household voluntarily give up one day each week when none of the vehicles would be driven?
   h. Would you favor a speed limit on rural 2-lane highways? If yes, what speed limit would be acceptable to you?
      50 mph _____
      45 mph _____
      40 mph _____
      35 mph _____
      30 mph _____
   i. Do you have any suggestions for conserving gasoline in rural areas and small cities? _____

In Owens.	Out Owens.	Never Buy

53. Where do you usually buy each of the following and why? Lines are for your comments.
   a. Groceries _____
   b. Hardware _____
   c. Drugs _____
   d. Appliances _____
   e. Clothing _____
   f. Furniture _____
   g. Automobiles _____
   h. Farm supplies _____
   i. Oil products _____
   j. Banking _____

Yes	No	No Opn	Don't Know

60. If you work outside your home, how do you usually travel to work?
   Drive alone _____
   Car pool _____
   Walk _____
   Bicycle _____
   Bus _____
61. Do you commute to work outside the Owensville area? If yes, how many miles do you travel to your place of work?
   0-5 _____
   6-10 _____
   11-20 _____
   21-30 _____
   More than 30 Miles _____

Hermann Community Attitude Survey

Dear Friend:

PLEASE READ CAREFULLY BEFORE TURNING THE PAGE

This questionnaire has been designed to give you an opportunity to voice your opinions about Hermann, what you like about it and what you would like to see changed. From the answers you and other Hermann citizens give, community leaders and officials will better be able to serve you in making Hermann a better place to live. YOUR OPINIONS ARE VERY IMPORTANT.

Do not sign your name to this questionnaire, but please give your honest and sincere opinions. There are no right or wrong answers. All the questions are a matter of opinion. Please complete all questions as best you can by checking "yes" or "no" in the space provided. If you do not have a definite opinion regarding any particular question, check "no opinion", and if you simply are not familiar with the issue involved in a question, check the "don't know" column. Feel free to write any comments on the back of the last page of the questionnaire.

You may respond with complete assurance that your identification with this survey will never be revealed. This survey is sponsored by the City of Hermann with the help of other organizations in Hermann.

WHEN YOU HAVE COMPLETED THE QUESTIONNAIRE, GIVE IT TO THE SURVEY COLLECTOR IF YOU ARE A RESIDENT OF HERMANN. The surveys will be collected Thursday evening, August 13, between 5:00 p.m. and 7:00 p.m. If you do not plan to be home, please leave the survey with a neighbor or attached to your door so it may be picked up. When the surveys have been collected, they will be sent to the University of Missouri for computer tabulation.

A SPECIAL NOTE TO CITIZENS OF BERGER, GASCONADE, MORRISON, RHINELAND, BAY, BIG SPRING, AND STONY HILL:

Please complete as much of the questionnaire as you feel applies to you. Boxes will be placed in banks and grocery stores in your communities for your convenience in returning the questionnaire. You may return forms also at the City Offices in the German School at Hermann. Those items which deal only with Hermann citizens may be left blank. Thank you for participating in this survey with the people of Hermann.

THANK YOU FOR YOUR COOPERATION.

YES	NO	NO OPN	DON'T KNOW

1. Are you satisfied with the following Hermann community services? (Answer "yes" if you are, "no" if you aren't, "no opinion" if you are undecided, "don't know" if you don't know enough about the service to have an opinion.) Please answer for each of the items in the list.

   a. Police protection
   b. Fire protection
   c. Streets
   d. Street lighting
   e. Water
   f. Sidewalks

In Hermann	Outside Hermann	Never Buy

41. Where do you usually buy each of the following?

   a. Groceries
   b. Hardware
   c. Drugs

   o. Adult clothing

Transportation •

47. Do you feel adequately informed concerning the impact of a severe gasoline shortage would have on transportation in small cities and rural areas?

Suppose there would be a nationwide gasoline shortage and you had to reduce use by 50%:

   a. Could your work schedule be changed to a 4-day work week?
   b. Could you share rides to work in a car pool?
   c. Would it be possible for you to walk to work?
   d. Would it be possible for you to ride a bicycle?
   e. Would you favor restricting students driving cars to high school?
   f. Would you be more likely to use the commuter park-and-ride lot now available?
   g. Could your household voluntarily give up one day each week when none of the vehicles would be driven?
   h. Would you favor a reduced speed limit on rural 2-lane highways?

   50 mph_____ 45 mph_____ 40 mph_____ 35 mph_____ 30 mph_____

   i. Do you have any other suggestions for conserving gasoline in rural areas and small cities?

   Would a local car pool matching service be useful to you now?

51. Do you or anyone in your household commute to work outside the Hermann area?

   Yes_____ No_____

52. If yes, how do you usually travel to work?

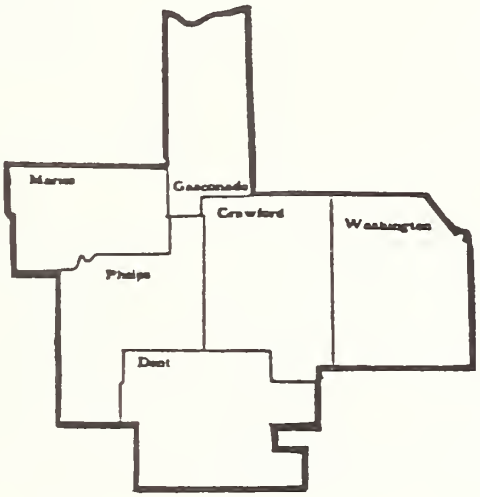
   Drive alone_____ Car pool_____

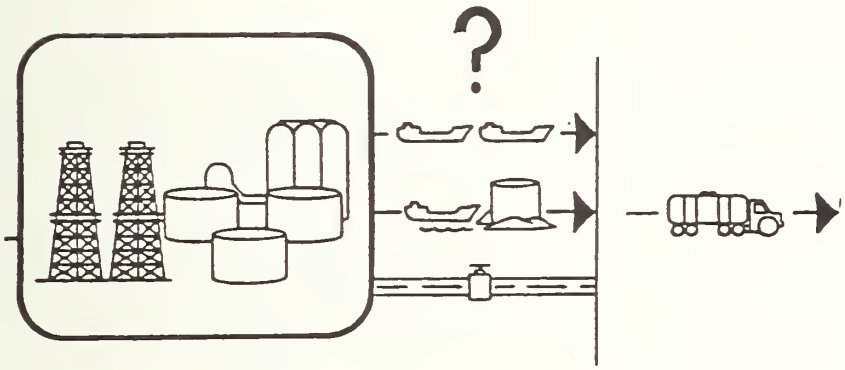
53. How many miles (one way) do you travel to work?

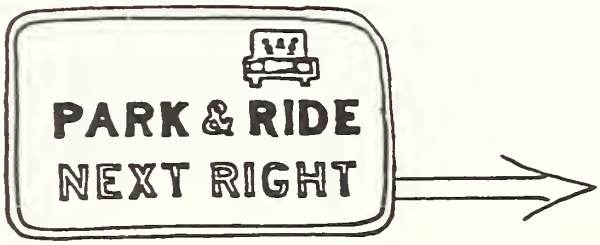
   0-5 miles_____ 6-10 miles_____ 11-20 miles_____ 21-30 miles_____ more than 30 miles_____

HANDBOOK FOR LOCAL AND REGIONAL GOVERNMENT
RESPONSE TO TRANSPORTATION FUEL EMERGENCIES

The Meramec Regional Planning Commission







APPENDIX D

HANDBOOK FOR LOCAL GOVERNMENT AND REGIONAL GOVERNMENT RESPONSE TO TRANSPORTATION FUEL EMERGENCIES

The Meramec Regional
Planning Commission
Rolla, Missouri 65401
December, 1981

Introduction:

This Handbook outlines the preparatory measures and the emergency actions that should be implemented by small communities and regional governments in the event of a transportation fuel emergency. It is assumed that the Regional Planning Commission (RPC) will be the lead agency in implementing and coordinating these activities at the local level. The RPC will function in the chain of communications, implement fuel conservation measures and coordinate with Energy Officers and Area Extension staff at the county level. The RPC will maintain a direct line of communication with the Energy Emergency Center in the Missouri Department of Natural Resources at Jefferson City.

Preparatory Actions:

1. The RPC shall retain the latest edition of the Department of Natural Resources, Division of Energy, Missouri Transportation Fuels Emergency Plan and other documents related to fuel conservation activities.

2. The RPC shall maintain a list of all current County and City Energy Officers, Directors, and Coordinators showing name, address and phone number; as published by the Missouri Department of Public Safety, Disaster Planning and Operations Office, Jefferson City.

3. The RPC shall maintain a list of all newspapers, radio stations and television stations serving the area, showing name, address and phone number for media serving its region.

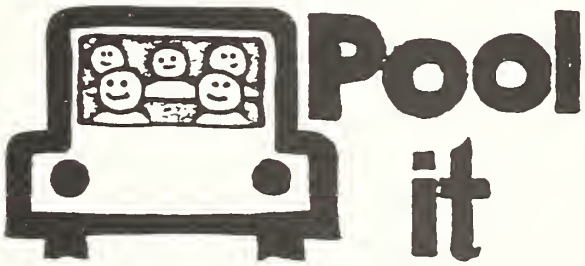
4. The Area Extension Service shall be requested to become familiar with educational programs related to transportation fuels conservation, to acquire them in advance and to begin to use them in the region. Both the RPC and the Area Extension Service should acquire sufficient quantities of the booklet "Get More Missouri per Gallon", to allow distribution throughout the region and to have available in their offices.

5. The County Energy Officer shall be requested to maintain an inventory of petroleum products distributors in his county, showing name, address, phone number, type of product handled, hours of operation, emergency equipment available. Communities with only one gasoline service station should be identified, and the Missouri Division of Energy requested to assure an adequate supply of fuel for these service stations.

6. The RPC shall maintain a supply of 20 General Highway Maps for each county in the region, and two copies of the General Highway Map for each adjacent county.

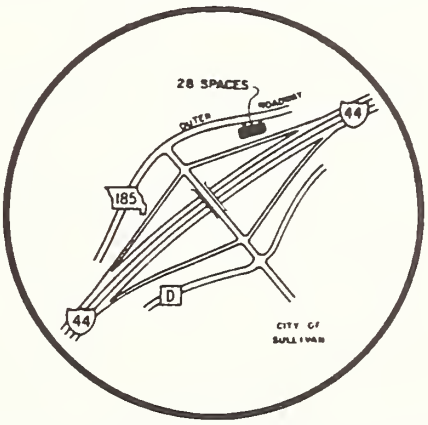
7. A list of communities who would have their own Local Ridesharing Coordination Office should be established. The likely location of that local office should be determined.

8. A list of employers of 25 or more people in the region should be established showing firm name, type of business, address, phone number and number of employees. Current carpooling efforts should be documented.



9. The RPC shall establish an inventory of public transportation providers in the region showing terminal locations, schedules and routes of taxi cab companies, as well as elderly and handicapped transportation services should be included in this list.

10. The RPC shall establish an inventory of existing commuter parking lots in the region showing location, size of lot and ownership.



11. The RPC shall establish an inventory of locations where it would be possible to establish commuter park-and-pool lots on short notice.

12. A list of school district transportation directors should be maintained by the RPC showing names, addresses and phone numbers of those directors. This list should also indicate the number of buses owned by the district, the number leased by the district and who the buses are leased from (if any are leased).

13. The coding procedure for Regional, County and Local Ride Boards should be established by the RPC. A convenient grid system must be utilized which would cover all counties in the region and all major destinations outside the region.

14. The RPC should establish a Mobility Advisory Committee which should be composed of members familiar with passenger transportation, freight movement, highway and bridge maintenance, airports, fuel distribution, transportation needs of special groups, and financing programs available in the rural transportation sector.

Responses to a Transportation Fuels Emergency:

1. The RPC shall contact the Missouri Energy Emergency Center to determine if a reserve set-aside supply of fuel will be established, and the procedures for making application for additional fuel supplies shall be determined.

2. A toll-free "800" number should be installed for a Regional Ridesharing Coordinator in RPC Headquarters.

3. A commuter parking lot program should be activated:
   A. Additional lots (existing facilities) should be signed, including the "800" telephone number for the Regional Ridesharing Coordinator.
   B. Commuter parking lots should be advertised on the radio and in the newspaper.

4. The Regional Ridesharing Coordination Center should be activated as well as any Local Ridesharing Centers desired by cities in the region.
   A. Ridesharing training sessions should be held for all coordinators who would be utilizing the manual matching procedures.
   B. Ride Boards should be constructed, coded and distributed.
   C. Large employers should be informed of the establishment of the ridesharing centers, and urged to participate by appointing an employee to assist in ridesharing efforts.

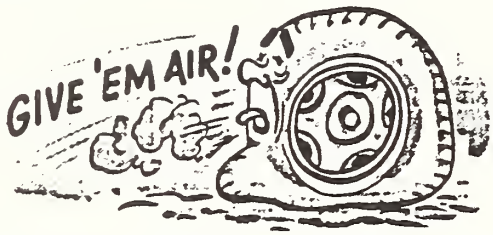
5. The Area Extension Service and the RPC should schedule educational sessions concerning vehicle maintenance, fuel-efficient driving techniques and trip planning. Educational sessions would have to be scheduled in the evening in most cases. Major employers should be requested to allow employees to attend training sessions during their lunch period.

6. The County Energy Officer should keep the RPC informed regarding local fuel supplies, service station operating hours and any difficulties that may emerge with respect to purchasing fuel.

7. Local Energy Officers should monitor the use of bicycles to determine if parking should be removed from certain streets to facilitate bike riding.

8. Community services should be curtailed by evaluating each service offered and deciding to eliminate the service or to provide a lower level of service.

9. Service stations should be requested to provide tire check service for their customers.



10. Educational materials should be distributed describing fuel-efficient driving techniques and proper vehicle maintenance.

11. School district transportation officers should be requested to serve as a Ridesharing Coordinator for the associated group of faculty, staff and students. A manual ridesharing matching system should be implemented, followed by re-evaluation of bus routes where isolated student pick-ups could be eliminated. Routes should be modified to limit the number of passenger pick-up and discharge points. Single occupant driving of cars should be highly discouraged.

12. An intensive program should be initiated to encourage people to walk to places of employment and leave their vehicle at home for most of their in-town trips. Conditions which may be hazardous to pedestrians should be monitored and corrected so walking would not be discouraged.

13. Facilities using drive-up windows (banks, fast-food establishments, liquor stores, etc.) should be requested to post signs encouraging their customers to shut off their vehicles and come into the building to conduct their business.

14. Traffic control devices should be assessed for the possibility of changing STOP signs to YIELD signs, and for placing traffic signals on flashing operation.

15. Major employers should have a group meeting to determine the desirability of adopting a 4-day work week in the locality. The decision to alter work days, or keep them as they are should be adhered to by all major employers in order to not eliminate the advantages that could be realized by ridesharing.

APPENDIX E

SELECTED FUNDING PROGRAMS ORIENTED TOWARD TRANSPORTATION FUEL CONSERVATION

At the time this report was being prepared, substantial reductions in budgets for many federal programs were being considered, with the possibility of some major re-organization to occur at the Cabinet level. It is quite likely that many of the transportation related programs will be reduced in scope, transferred to another agency or eliminated. The new administration believes that many of the federal energy conservations programs are more properly housed at other levels of government or perhaps in the private sector. During the period of transition, it is somewhat difficult to identify those funding programs which will be in existence even several months from now. Therefore, the review of potential funding sources for transportation fuel conservation measures, or closely related measures, will be limited to only those programs which appear to have a relatively secure future.

The Section 18 Public Transportation Formula Grant Program:

The Section 18 Program offers Federal assistance for public transportation projects in rural areas and cities with less than 50,000 population. An Emergency Regulation to implement Section 18 became effective December 13, 1978, when the Federal Highway Administration and the Urban Mass Transportation Administration published their proposed requirements and procedures in the Federal Register (43 FR 58308). As stated in the Federal Register, "The goals of this program are to enhance access of people in nonurbanized areas for purposes such as health care, shopping, education, recreation, public services, and employment by encouraging the maintenance, development, improvement, and use of passenger transportation systems."

Federal funds made available to the states through Section 18 may be used to carry out technical assistance projects, for capital assistance, or for public transportation system operating expenses. Technical assistance activities are 100% Federally supported and include project planning, program development, management development, coordination of public transportation programs, and research efforts which may be appropriate. Capital assistance and administrative expenses are eligible for Section 18 support to the extent of 80% of the net cost. Operating expenses are eligible for Section 18 support to the extent of 50% of the net operating costs, or deficit.

In Missouri the State agency designated by the Governor to receive and administer Section 18 funding is the Missouri Department of Highways and Transportation. The 20 regional planning commissions in the state have all been allocated funds to prepare their public transportation plans, including

the Meramec Regional Planning Commission. Furthermore, at least 16 Missouri communities have been allocated Section 18 funds for public transportation plan development.

The Missouri Department of Highways and Transportation has developed procedures for computing those portions of the total State Section 18 allocation for capital assistance or operating expense funding which each planning commission and community may receive. Rolla is eligible for $19,629.65 in funding for fiscal year 1980 and $20,103.64 in fiscal year 1981. During these same time periods, the amounts available to the Meramec Regional Planning Commission are $34,039.22 and $34,861.16, respectively. In some instances, it may be possible for communities to request and receive part of a regional allocation, and perhaps certain funds which have been held in reserve at the state level. Examples of rural and small city Section 18 projects which have been funded recently in Missouri are shown in Table E-1. Statewide allocations to Missouri totalled $1,859,450 for fiscal year 1980, and $2,117,709 for fiscal year 1981.

Federal-Aid Highway Programs:

Ridesharing: Support for ridesharing projects has been available from several sources, however, this discussion will be limited to Federal-Aid Highway funds only. It is the Federal Highway Administration policy to strongly encourage states and local areas to use Federal-aid primary, secondary and urban system funds for ridesharing projects such as:

A. Acquisition of vanpool vehicles for a vanpool program, as long as user fees are charged for vehicle depreciation, operating costs and maintenance; and the acquisition cost is paid over the live of the vehicle.

B. Public information and promotion expenses.

C. Systems, manual or computerized, for locating and informing participants of potential carpools, vanpools or buspools.

This is a 75/25 matching program, with the local 25% share eligible for in-kind match. Further details concerning availability of funds and suitability of specific projects may be obtained from the District Engineer's Office in Springfield, Missouri. Projects implemented in Missouri include a vanpool at Washington University (5 vans) and McDonnel-Douglas (8 vans) in St. Louis. Small communities and most organizations would be eligible for this program.

Parking Facilities: Subsequent to the Federal-Aid Highway Act of 1968 parking facilities have been eligible for support. The program has been expanded by allowing Interstate, primary, secondary and urban extension funds to be used for this purpose. The Surface Transportation Act of 1978 made it possible in some cases to approve facilities that serve carpools

TABLE E-1. EXAMPLES OF RECENT SECTION 18 PROJECTS IN MISSOURI

Applicant	Type of Improvement and Duration	Federal Funds	Local Funds
Sedalia	Nonoperating Assistance, Sept. '80 - June '81; Buy Five 20-Passenger Buses; Administrative Costs.	157,520	39,380
	Operating Assistance, Mar.- June '81.	20,600	20,600
	Operating Assistance, July '81 - June '82.	50,000	50,000
	Nonoperating Assistance, July '81 - June '82.	61,000	14,000
	Design and Construction of Bus Facility April '81 - Sept. '81.	48,000	12,000
Bloomfield	Nonoperating Assistance, July '80 - June '81. Buy One 15-Passenger Van.	14,696	3,674
	Operating Assistance, July '80 - June '81.	4,150	4,150
	Nonoperating Assistance, July '81 - June '82.	3,600	900
	Operating Assistance, July '81 - June '82.	4,500	4,500
SMTS (For 26 counties.)	Nonoperating Assistance, July '81 - June '82. Administrative Costs.	240,000	60,000
Lebanon (Project Pending Approval)	Nonoperating Assistance, Nov. '81 - Oct. '82. Administrative Costs, Buy One 17-Passenger Bus.	40,000	10,000
	Operating Assistance, Nov. '81 - Oct. '82.	15,000	15,000

and/or vanpools where there may be no public transit service. The following specific items are among those eligible for Federal-aid funding:

A. Preliminary engineering
B. Right-of-way
C. Initial and renewal costs to lease public or private parking space, such as at shopping centers
D. On-site signing and pavement markings
E. Lighting and security facilities
F. Parking and safe storage for bicycles, mopeds, etc.

Bicycle Facilities: Independent bikeway projects may be financed with all types of Federal-Aid funds, except Interstate, subject to maximum limitations on the amount spent in any particular state. Independent projects may be constructed on completed sections of Federal-Aid highways and may include the acquisition of land outside the right-of-way in certain cases. At least two smaller communities in Missouri (Sikeston and Oak Grove) have applied for bicycle project funding. Highway Planning and Research Funds and Planning Funds may be used to assist in bicycle facility planning.

Signal System Optimization: Improvements in signalization are supported 100% by regular Federal-Aid Highway funds. The Federal Highway Administration has several manual techniques and computer programs which may be utilized to optimize traffic signal timing. During Fiscal Year 1981-82 a special demonstration project will take place in Missouri to evaluate and update signal timing in many small communities.

Signal System Modernization: This program is also supported with 100% Federal-Aid for the following types of activities:

A. Replace obsolete equipment
B. Improve signal coordination
C. Accommodate additional turning movements
D. Refine signal timing plans
E. Add system controls

Initially, each state was allowed to use 10% of all their Federal-Aid funds for projects of this concerning signal modernization.

Highway Planning and Research Programs: Certain activities regularly scheduled by the Division of Planning, Missouri Department of Highways and Transportation, have some relationship to traffic planning in rural areas and small cities. In cities of the population range 10,000-50,000 residents a traffic map is prepared every three years showing the Average Daily Traffic on the city streets and highways. Also for this population group an origin-destination study is performed every seven years on a rotating basis.

In cities of the population range 5,000-10,000 traffic maps are prepared every five years on a rotating basis. The Highway Department has tentative plans to expand their traffic map program to cities in the population range 2,000-5,000 at eight year intervals.

Traffic Engineering Assistance Program:

The primary objective of this program is to make available in the rural areas of the state the mechanism by which Traffic Engineering consultation services may be obtained. The supporting monies are Highway Safety funds passed through the Department of Public Safety to the Missouri Department of Highways and Transportation. Requests for services are made through the District Engineers Office. Typical studies which have been performed are:

A. Traffic control devices, inventory and layout
B. Capacity analysis
C. Traffic accident analysis
D. Traffic counts
E. Minor origin and destination surveys

Future funding for this program is not certain, however, it is being mentioned since it is a program of some importance in rural areas and small cities.

Missouri Driver Energy Conservation Awareness Training (DECAT):

The DECAT program at Central Missouri State Universtiy is providing training in fuel-efficient driving techniques to local governments, state fleet operations personnel, state school bus operators, and driver education teachers. Other groups are also eligible to attend on a space-available basis. One of their programs is in a twenty-hour format designed for those who will be instructing DECAT techniques in the future; the other is a three hour training program to review and provide limited practice with fuel efficient techniques. There is no fee associated with this training at the present time.

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